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Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement - Site G (Data Supplement)

EVB, Inc.
Minneapolis, MN

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Arlington VA 22209

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Research Triangle Park NC 27711
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April 1980

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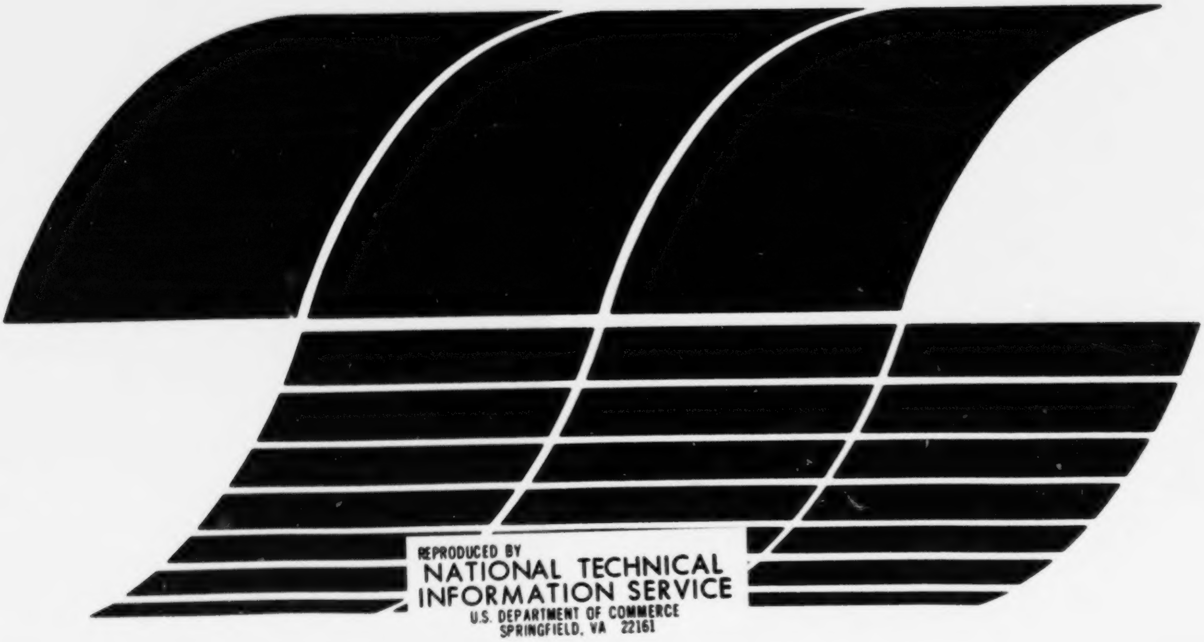
Interagency Energy/Environment R&D Program Report



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(Data Supplement)

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1a

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The Data Supplement is a compilation of test data presented in greater detail than was practical in the Final Technical Report. It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume. The Supplement contains panel board data for each test, detailed particulate, O_2, CO_2, CO, NO, NO_2, SO_2 and SO_3 data, particle size distribution data, chemical analysis of the coal, coal size consistency data, and combustible analysis and overfire air traverse data.

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FOREWORD

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.[1] It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler G; as it is the seventh boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

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[1] Langsjoen, P. L., et al., "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site G."

CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

To Convert From	To	Multiply By
in	cm	2.540
in^2	cm^2	6.452
ft	m	0.3048
ft^2	m^2	0.09290
ft^3	m^3	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
lb/10^{6}BTU	ng/J	430
g/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	2324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
BTU/ft^2/hr	W/m^2	3.152
BTU/ft^2/hr	J/hr/m^2	11349
BTU/ft^3/hr	W/m^3	10.34
BTU/ft^3/hr	J/hr/m^3	37234
psia	Pa	6895
"H_2O	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R

FOR TYPICAL COAL FUEL

ppm @ 3% O_2 (SO_2)	ng/J (lb/10^{6}Btu)	0.851 (1.98x10^{-3})
ppm @ 3% O_2 (SO_3)	ng/J (lb/10^{6}Btu)	1.063 (2.47x10^{-3})
ppm @ 3% O_2 (NO)*	ng/J (lb/10^{6}Btu)	0.399 (9.28x10^{-4})
ppm @ 3% O_2 (NO_2)	ng/J (lb/10^{6}Btu)	0.611 (1.42x10^{-3})
ppm @ 3% O_2 (CO)	ng/J (lb/10^{6}Btu)	0.372 (8.65x10^{-4})
ppm @ 3% O_2 (CH_4)	ng/J (lb/10^{6}Btu)	0.213 (4.95x10^{-4})

*Federal environmental regulations express NOx in terms of NO_2; thus NO units should be converted using the NO_2 conversion factor.

CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

To Convert From	To	Multiply By
cm	in	0.3937
cm^2	in^2	0.1550
m	ft	3.281
m^2	ft^2	10.764
m^3	ft^3	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	lb/10^6BTU	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	0.000430
J/hr/m	BTU/ft/hr	0.000289
J/hr/m^2	BTU/ft^2/hr	0.0000881
J/hr/m^3	BTU/ft^3/hr	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m^2	BTU/ft^2/hr	0.317
W/m^3	BTU/ft^3/hr	0.0967
Pa	psia	0.000145
Pa	"H_2O	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

FOR TYPICAL COAL FUEL

ng/J	ppm @ 3% O_2 (SO_2)	1.18
ng/J	ppm @ 3% O_2 (SO_3)	0.941
ng/J	ppm @ 3% O_2 (NO)	2.51
ng/J	ppm @ 3% O_2 (NO_2)	1.64
ng/J	ppm @ 3% O_2 (CO)	2.69
ng/J	ppm @ 3% O_2 (CH_4)	4.69

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto*	h
10^{1}	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

EMISSION UNITS CONVERSION FACTORS
FOR TYPICAL COAL FUEL (HV = 13,320 BTU/LB)

To Obtain \ Multiply By		% Weight in Fuel		lbs/10^6Btu		grams/10^6Cal		PPM (Dry @ 3% O_2)		Grains/SCF. (Dry @ 12% CO_2)	
		S	N	SO_2	NO_2	SO_2	NO_2	SOx	NOx	SO_2	NO_2
% Weight In Fuel	S	1		0.666	▨	0.370	▨	$13.2x10^{-4}$	▨	1.48	▨
	N			▨	0.405	▨	0.225	▨	$5.76x10^{-4}$	▨	.903
lbs/10^6Btu	SO_2	1.50	▨	1		(.556)	▨	$19.8x10^{-4}$	▨	(2.23)	▨
	NO_2	▨	2.47			▨	(.556)	▨	$14.2x10^{-4}$	▨	(2.23)
grams/10^6Cal	SO_2	2.70	▨	(1.8)	▨	1		$35.6x10^{-4}$	▨	(4.01)	▨
	NO_2	▨	4.44	▨	(1.8)			▨	$25.6x10^{-4}$	▨	(4.01)
PPM (Dry @ 3% O_2)	SOx	758	▨	505	▨	281	▨	1		1127	▨
	NOx	▨	1736	▨	704	▨	391			▨	1566
Grains/SCF (Dry @ 12% CO_2)	SO_2	.676	▨	(.448)	▨	(.249)	▨	$8.87x10^{-4}$	▨	1	
	NO_2	▨	1.11	▨	(.448)	▨	(.249)	▨	$6.39x10^{-4}$		

NOTE: 1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.
2. Standard reference temperature of 530°R was used.

SECTION 1.0

PANEL BOARD DATA

1.1 CONTROL ROOM DATA SHEETS PAGE 2

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 69,153
% Design Capacity 92.2
Coal A

TEST NUMBER	1				
DATE	2-10-79				
DESCRIPTION	Max OFA				
INTEGRATOR	363057	363217			
STEAM FLOW					
TIME OF READING	13:37	15:35			
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	63				
AIR FLOW, RELATIVE	65				
FLUE GAS TEMP, °F	510				
STEAM HEADER PRESSURE, PSIG	138				
OPACITY, %	005				
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	+0.1				
UNDERGRATE PRESSURE, "H_2O	+2.0				
FURNACE PRESSURE, "H_2O	-0.1				
LER OUTLET PRESSURE, "H_2O	-1.0				
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.2				

Sheet 2 of 3

KVB

TEST NUMBER	1				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	173				
STEAM PRESSURE, PSIG	138				
CONTROLS					
COAL/AIR RATIO	86				
BOILER LOAD	70				
COAL FEEDER BIAS	68				
FD FAN	97				
OFA FAN	86				
ID FAN DAMPER	22				
FEEDWATER	64				
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	22"				
REAR UPPER OFA	22"				
REAR LOWER OFA	22"				
FURNACE					
ASH BED DEPTH, INCHES	1½-2"				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 63,750
% Design Capacity 85
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	2				
DATE	2-11-79				
DESCRIPTION	60,000 lbs				
	max O.F.A 23"				
INTEGRATOR					
STEAM FLOW	363712	363780	363859	363 907	
TIME OF READING	9:03	10:08	11:06	11:47	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	64	64	60		
AIR FLOW, RELATIVE	62	62	58		
FLUE GAS TEMP, °F	500	500	500		
STEAM HEADER PRESSURE, PSIG	137	138	136		
OPACITY, %	005	005	005		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	.3	.3	.3		
UNDERGRATE PRESSURE, "H_2O	.9	1.0	.8		
FURNACE PRESSURE, "H_2O	-.1	-0.1	-0.1		
LER OUTLET PRESSURE, "H_2O	-1.0	-1.2	-1.0		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.2	-5.5	-5.0		

Sheet 2 of 3

KVB

TEST NUMBER	2				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	171	182	173		
STEAM PRESSURE, PSIG	138	138	138		
CONTROLS					
COAL/AIR RATIO	80	81	82		
BOILER LOAD	80	68	62		
COAL FEEDER BIAS	80	60	62		
FD FAN	82	94	94		
OFA FAN	84	86	84		
ID FAN DAMPER	32	28	26		
FEEDWATER	62	58	74		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	min	min	min		
FRONT LOWER OFA	23"	23"	23"		
REAR UPPER OFA	23"	23"	23"		
REAR LOWER OFA	23"	23"	23"		
FURNACE					
ASH BED DEPTH, INCHES	1½"	1½-2"	1½		
Temp fan	67°F				
RH	46%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 59701

% Design Capacity 79.6

Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	3				
DATE	2-11-79				
DESCRIPTION	60000 lbs				
	avg. OFA				
INTEGRATOR					
STEAM FLOW	4022	4110	4176	4214	
TIME OF READING	15:13	16:23	17:25	17:51	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	60	62	58		
AIR FLOW, RELATIVE	60	64	60		
FLUE GAS TEMP, °F	500	500	480		
STEAM HEADER PRESSURE, PSIG	139	139	139		
OPACITY, %	005	005	005		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	3	.3	.3		
UNDERGRATE PRESSURE, "H_2O	8	8	.7		
FURNACE PRESSURE, "H_2O	-.13	-.15	-.10		
LER OUTLET PRESSURE, "H_2O	-1.0	-1.0	-1.0		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-4.5	-4.5	-4.5		

Sheet 2 of 3

KVB

TEST NUMBER					
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	172	187	185		
STEAM PRESSURE, PSIG	138	139	138		
CONTROLS					
COAL/AIR RATIO	80	80	80		
BOILER LOAD	78	76	70		
COAL FEEDER BIAS	76	58	72		
FD FAN	90	90	90		
OFA FAN	45	42	42		
ID FAN DAMPER	20	20	20		
FEEDWATER	70	70	70		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	[illegible]				
FRONT LOWER OFA	18"				
REAR UPPER OFA	15"				
REAR LOWER OFA	12"				
FURNACE					
ASH BED DEPTH, INCHES	1½"	2"	2"		

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr ~~[illegible]~~ 57,557
% Design Capacity 76.7
Coal A

TEST NUMBER	4				
DATE	2-16-79				
DESCRIPTION	swing load				
INTEGRATOR					
STEAM FLOW	5806	5897	5450	6043	
TIME OF READING	1400	15:15	16:07	17:30	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	52	60	70		
AIR FLOW, RELATIVE	54	60	65		
FLUE GAS TEMP, °F	440	500	540		
STEAM HEADER PRESSURE, PSIG	134	140	140		
OPACITY, %	005	005	006		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	0.2		
UNDERGRATE PRESSURE, "H_2O	0.6	0.6	0.7		
FURNACE PRESSURE, "H_2O	-.12	-.12	-.10		
LER OUTLET PRESSURE, "H_2O	-0.9	-0.9	-1.0		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-3.8	-4.2	-4.0		

Sheet 2 of 3

KVB

TEST NUMBER	4	4	4		
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	176	175	173		
STEAM PRESSURE, PSIG	140	140	140		
CONTROLS					
COAL/AIR RATIO	62	74	70		
BOILER LOAD	70	70	70		
COAL FEEDER BIAS	68	66	66		
FD FAN	84	96	96		
OFA FAN	72	84	83		
ID FAN DAMPER	20	22	22		
FEEDWATER	60	66	64		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	22"				
REAR UPPER OFA	22"				
REAR LOWER OFA	22"				
FURNACE					
ASH BED DEPTH, INCHES	1½"	1½			
Twet	57°F				
Temp FD fan Tdry	75°F				
RH	33%				

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 76,238
% Design Capacity 101.7
Coal A

TEST NUMBER	5				
DATE	2-17-79				
DESCRIPTION	75,000 lbs with [illegible]				
INTEGRATOR					
STEAM FLOW	6654	6762	6998		
TIME OF READING	9:10	10:21	13.00		
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	77	78			
AIR FLOW, RELATIVE	67	67			
FLUE GAS TEMP, °F	530	550			
STEAM HEADER PRESSURE, PSIG	138	138			
OPACITY, %	006	005			
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	+.2	+.2			
UNDERGRATE PRESSURE, "H_2O	+1.0	+0.9			
FURNACE PRESSURE, "H_2O	-0.10	-0.10			
LER OUTLET PRESSURE, "H_2O	-0.12	-0.12			
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.7	-5.8			

Sheet 2 of 3

KVB

TEST NUMBER	5				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	174	178			
STEAM PRESSURE, PSIG	136	138			
CONTROLS					
COAL/AIR RATIO	92	94			
BOILER LOAD	100	80			
COAL FEEDER BIAS	98	76			
FD FAN	99	98			
OFA FAN	94	94			
ID FAN DAMPER	28	28			
FEEDWATER	83	80			
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	23"				
REAR UPPER OFA	22"				
REAR LOWER OFA	22"				
FURNACE					
ASH BED DEPTH, INCHES	2½-3"				
	clinker '3				
FD fan Temp	73°F				
RH	32%				

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 43,060
% Design Capacity 57 4
Coal A

TEST NUMBER	6				
DATE	2-17-79				
DESCRIPTION	45,000				
INTEGRATOR					
STEAM FLOW	7106	7174	7216	7247	
TIME OF READING	15:50	17:12	18:01	18:37	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	46	46	47		
AIR FLOW, RELATIVE	45	45	46		
FLUE GAS TEMP, °F	430	430	430		
STEAM HEADER PRESSURE, PSIG	141	141	142		
OPACITY, %	005	005	005		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	+.2	+.2	+.2		
UNDERGRATE PRESSURE, "H_2O	+.4	+.3	+.4		
FURNACE PRESSURE, "H_2O	-.10	-.12	-.10		
LER OUTLET PRESSURE, "H_2O	-.5	-.6	-.6		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-3.0	-3.0	-3.0		

Sheet 2 of 3

KVB

TEST NUMBER	6				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	182	181	181		
STEAM PRESSURE, PSIG	140	141	141		
CONTROLS					
COAL/AIR RATIO	52	53	53		
BOILER LOAD	56	53	49		
COAL FEEDER BIAS	52	50	48		
FD FAN	70	70	69		
OFA FAN	56	53	55		
ID FAN DAMPER	14	14	14		
FEEDWATER	57	56	56		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	18"				
REAR UPPER OFA	20"				
REAR LOWER OFA	18"				
FURNACE					
ASH BED DEPTH, INCHES	1½"-2"				
Temp FD fan Tdry	73F				
Twet	55F				
	32%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 13,005
% Design Capacity 17.3
Coal B

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	7				
DATE	2-25-79				
DESCRIPTION	15,000 lbs/hr coal B				
INTEGRATOR					
STEAM FLOW	371100	371121	371145	371151	
TIME OF READING	9:33	10:43	12:30	12 53	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	15	13	15		
AIR FLOW, RELATIVE	20	21	23		
FLUE GAS TEMP, °F	325	320	325		
STEAM HEADER PRESSURE, PSIG	140	141	141		
OPACITY, %					
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	0.1	0.1		
UNDERGRATE PRESSURE, "H_2O	~0	~0	~0		
FURNACE PRESSURE, "H_2O	-0.15	-0.17	-0.15		
LER OUTLET PRESSURE, "H_2O	-0.3	-0.3	-0.3		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-1.1	-1.2	-1.3		

Sheet 2 of 3

KVB

TEST NUMBER	7				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	174	174	174		
STEAM PRESSURE, PSIG	140	142	141		
CONTROLS					
COAL/AIR RATIO	20	16	18		
BOILER LOAD	70	55	60		
COAL FEEDER BIAS	70	55	60		
FD FAN	27	27	36		
OFA FAN	20	18	20		
ID FAN DAMPER	7	7	8		
FEEDWATER	40	37	40		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	5"	15"			
REAR UPPER OFA	5"	15"			
REAR LOWER OFA	5"	15"			
FURNACE					
ASH BED DEPTH, INCHES	2"	1"			
	lots of clinkers	clinkers			
Temp FD fan Tdry = 75°F					
Twet = 58°F					

RH = 41%

Sheet 3 of 3

KVB

NOTES

TEST NO: 7 Stack was dirty so O.F.A was raised to 15" at 9:45,
but stack didn't get any cleaner
Operator says he as tried all combinations and nothing seems
to work

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 74,690
% Design Capacity 99.6
Coal B

TEST NUMBER	8				
DATE	2-25-79				
DESCRIPTION	75,000				
	coal B				
INTEGRATOR					
STEAM FLOW	371245	371391	371472		
TIME OF READING	15:37	17.17	18:12		
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	76	73			
AIR FLOW, RELATIVE	65	63			
FLUE GAS TEMP, °F	512	510			
STEAM HEADER PRESSURE, PSIG	141	140			
OPACITY, %	005	005			
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	.1			
UNDERGRATE PRESSURE, "H_2O	1.0	.9			
FURNACE PRESSURE, "H_2O	-0.10	-0.11			
LER OUTLET PRESSURE, "H_2O	-1.1	-1.1			
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.4	-5.6			

Sheet 2 of 3

KVB

TEST NUMBER	8				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	179	180			
STEAM PRESSURE, PSIG	140	140			
CONTROLS					
COAL/AIR RATIO	90	84			
BOILER LOAD	78	64			
COAL FEEDER BIAS	76	67			
FD FAN	100	98			
OFA FAN	99	90			
ID FAN DAMPER	20	23			
FEEDWATER	98	65			
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	21"				
REAR UPPER OFA	22"				
REAR LOWER OFA	21'				
FURNACE					
ASH BED DEPTH, INCHES	1½" avg	3/4, 1½, 1½			

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 54,217
% Design Capacity 72.3
Coal A

TEST NUMBER	9				
DATE	2-28-79				
DESCRIPTION	SASS				
	coal A				
INTEGRATOR					
STEAM FLOW	374485	374725	374821	374940	
TIME OF READING	11.00	14:20	15:46	18:08	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	76	56	46	52	
AIR FLOW, RELATIVE	60	50	40	50	
FLUE GAS TEMP, °F	540	480	410	500	
STEAM HEADER PRESSURE, PSIG	135	138	138	138	
OPACITY, %	005	005	005	005	
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	01	01		
UNDERGRATE PRESSURE, "H_2O	1.0	0.80	0.50		
FURNACE PRESSURE, "H_2O	-0.08	-0.08	-0.10		
LER OUTLET PRESSURE, "H_2O	-1.0	-1.0	-0.8		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.3	-4.5	-3.5		

heet 2 of 3

KVB

TEST NUMBER	9	9			
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	175	178	179		
STEAM PRESSURE, PSIG	136	140	138		
CONTROLS					
COAL/AIR RATIO	92	74	60		
BOILER LOAD	96	64	76		
COAL FEEDER BIAS	94	64	76		
FD FAN	100	90	76		
OFA FAN	96	78	61		
ID FAN DAMPER	26	20	18		
FEEDWATER	78	64	57		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none	none			
FRONT LOWER OFA	22"	22"			
REAR UPPER OFA	22"	22"			
REAR LOWER OFA	22"	22"			
FURNACE					
ASH BED DEPTH, INCHES	2½-3"	3"-3½"	3"		
Temp 8:7 pm	79°F				
RH	30%				

Sheet 3 of 3

KVB

NOTES

TEST NO: 9: load by the hour

11-12 - 75,000

1230 - 45,000 lunch

13-14 60-65,000

14-17 50,000

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Sheet 1 of 3

KVB

Steam Flow, lb/hr 64,508
% Design Capacity 86.0%
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	10				
DATE	3-2-79				
DESCRIPTION	swingload				
	normal				
INTEGRATOR					
STEAM FLOW	376732	376831	376917	376966	
TIME OF READING	10:33	11:45	13:02	13:38	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	70	70	60		
AIR FLOW, RELATIVE	69	65	58		
FLUE GAS TEMP, °F	530	520	500		
STEAM HEADER PRESSURE, PSIG	136	136	134		
OPACITY, %	005	005	005		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	0.1	0.1		
UNDERGRATE PRESSURE, "H_2O	1.0	1.0	1.0		
FURNACE PRESSURE, "H_2O	-0.1	-0.1	-0.1		
LER OUTLET PRESSURE, "H_2O	-1.1	-1.0	-1.1		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.5	-5.5	-5.5		

Sheet 2 of 3

KVB

TEST NUMBER	10				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	176	178	174		
STEAM PRESSURE, PSIG	138	138	138		
CONTROLS					
COAL/AIR RATIO	90	82	80		
BOILER LOAD	84	84	84		
COAL FEEDER BIAS	84	84	83		
FD FAN	100	100	95		
OFA FAN	100	96	90		
ID FAN DAMPER	26	26	24		
FEEDWATER	73	70	65		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	None				
FRONT LOWER OFA	21"				
REAR UPPER OFA	21"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	3-4"		3-4"		
F.D fan Temp Tdry	80°F				
Twet	62°F				
RH	37%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 58,418
% Design Capacity 779
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	11				
DATE	3-3-79				
DESCRIPTION	60,000 gaseous				
INTEGRATOR					
STEAM FLOW	377596	377676	377716	377769	377785
TIME OF READING	7:55	9:00	9:39	10:24	10:40
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	61	61	60	60	
AIR FLOW, RELATIVE	57	49	44	40	
FLUE GAS TEMP, °F	480	475	460	450	
STEAM HEADER PRESSURE, PSIG	136	137	137	138	
OPACITY, %	005	005	005	05	
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	0.2	0.2	
UNDERGRATE PRESSURE, "H_2O	0.9	0.7	0.5	0.5	
FURNACE PRESSURE, "H_2O	-.12	-.10	-.10	-.12	
LER OUTLET PRESSURE, "H_2O	-1.0	-.08	-.07	-.06	
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-4.4	-4.0	-3.0	-2.9	

Sheet 2 of 3

KVB

TEST NUMBER	11				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	170	171	171	172	
STEAM PRESSURE, PSIG	138	140	140	140	
CONTROLS					
COAL/AIR RATIO	73	72/65	70/53	71/50	
BOILER LOAD	72	66	66	60	
COAL FEEDER BIAS	72	66	68	60	
FD FAN	88	80	68	70	
OFA FAN	75	68	55	52	
ID FAN DAMPER	22	18	15	14	
FEEDWATER	64	66	66	67	
OVERFIRE AIR TAPS					
FRONT UPPER OFA	None				
FRONT LOWER OFA	21"				
REAR UPPER OFA	21"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	3"	3"	3"	3"	
			#3 (right) side is clinkering a little		

Sheet 1 of 3

KVB

Steam Flow, lb/hr 73,703
% Design Capacity 98.3
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	12				
DATE	3-3-74				
DESCRIPTION	75,000 gaseous				
INTEGRATOR					
STEAM FLOW	377830	377907	377976	378043	378054
TIME OF READING	11:12	12:06	12:54	13:24	13:47
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	74	74	75	75	
AIR FLOW, RELATIVE	66	63	60 55	50	
FLUE GAS TEMP, °F	530	520	520	500	
STEAM HEADER PRESSURE, PSIG	138	137	137	137	
OPACITY, %	005	005	005	005	
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	0.2	0.2	
UNDERGRATE PRESSURE, "H_2O	0.9	0.9	.8	0.8	
FURNACE PRESSURE, "H_2O	-0.15	-0.12	-0.11	0.09	
LER OUTLET PRESSURE, "H_2O	-1.2	-1.1	-1.0	-0.9	
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.3	-5.0	-48	-4.0	

Sheet 2 of 3

KVB

TEST NUMBER	12				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	176	176	176	176	
STEAM PRESSURE, PSIG	139	139	139	139	
CONTROLS					
COAL/AIR RATIO	87	86/82	90/80	86/66	
BOILER LOAD	66	76	76	75	
COAL FEEDER BIAS	65	74	74	74	
FD FAN	98	94	92	80	
OFA FAN	90	86	82	70	
ID FAN DAMPER	26	25	24	26	
FEEDWATER	78	77	76	76	
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	22"				
REAR UPPER OFA	22"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	3"	3"	3"	3"	

Sheet 1 of 3

KVB

PANEL BOARD DATA
ABMA TEST SITE G

Steam Flow, lb/hr 65,571
% Design Capacity 87.4
Coal A

TEST NUMBER	15				
DATE	3-16				
DESCRIPTION	SASS				
	varying load				
INTEGRATOR					
STEAM FLOW	11:00	12:30	15:20	16:50	
TIME OF READING	390950	391054	391 286	391,400	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	60	50	75		
AIR FLOW, RELATIVE	58	45	65		
FLUE GAS TEMP, °F	520	470	530		
STEAM HEADER PRESSURE, PSIG	136	136	136		
OPACITY, %	OOS	OOS	OOS		
	slightly brown	white	slightly brow		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.3	0.3	0.3		
UNDERGRATE PRESSURE, "H_2O	0.8	0.8	1.0		
FURNACE PRESSURE, "H_2O	-.15	-.08	-.10		
LER OUTLET PRESSURE, "H_2O	-1.0	-1.0	-1.1		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-4.7	-4.6	-5.3		

Sheet 2 of 3

KVB

TEST NUMBER	15				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	174	179	178		
STEAM PRESSURE, PSIG	136	138	137		
CONTROLS					
COAL/AIR RATIO	74	78	86		
BOILER LOAD	90	72	84		
COAL FEEDER BIAS	90	72	83		
FD FAN	94	94	100		
OFA FAN	82	82	94		
ID FAN DAMPER	24	21	26		
FEEDWATER	62	53	68		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	None				
FRONT LOWER OFA	21"				
REAR UPPER OFA	21"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	4" even	4"			

Sheet 3 of 3

KVB

NOTES

TEST NO: load - 11-12 70-75,000
12-13 65,000
13-14 65,000
14-15 65,000

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Sheet 1 of 3

KVB

Steam Flow, lb/hr 11,854
% Design Capacity 15.8
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	16				
DATE	3-17-79				
DESCRIPTION	part 15 Klbs				
INTEGRATOR					
STEAM FLOW	391893	391916	391929	391936	
TIME OF READING	8:50	1030	11:22	11:55	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	14	15	13		
AIR FLOW, RELATIVE	18	19	17		
FLUE GAS TEMP, °F	320	325	312		
STEAM HEADER PRESSURE, PSIG	137	138	137		
OPACITY, %	005	005	005		
	brown	brown	brown		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	0.1	0.2		
UNDERGRATE PRESSURE, "H_2O	~0	~0	~0		
FURNACE PRESSURE, "H_2O	-.12	-.12	-.12		
LER OUTLET PRESSURE, "H_2O	-.4	-.4	-.3		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-1.3	-1.3	-1.2		

Sheet 2 of 3

KVB

TEST NUMBER	16				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	172	173	172		
STEAM PRESSURE, PSIG	138	138	138		
CONTROLS					
COAL/AIR RATIO	17	18	16		
BOILER LOAD	70	72	68		
COAL FEEDER BIAS	70	72	66		
FD FAN	33	35	24		
OFA FAN	18	20	18		
ID FAN DAMPER	6	12	6		
FEEDWATER	40	40	37		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	7"				
REAR UPPER OFA	7"				
REAR LOWER OFA	7'				
FURNACE					
ASH BED DEPTH, INCHES	2"	2"	1-2"		
	clinkers				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 73,268
% Design Capacity 97.7
Coal A

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	17				
DATE	3-17-79				
DESCRIPTION	75,000				
	without flyash reinjection				
INTEGRATOR					
STEAM FLOW	[illegible]	392161		2276	
TIME OF READING	[illegible]	16:42	17:52	18:02	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	77	75	76		
AIR FLOW, RELATIVE	67	65	66		
FLUE GAS TEMP, °F	530	630	530		
STEAM HEADER PRESSURE, PSIG	135	135	135		
OPACITY, %	005	005	005		
	brown (slightly)				
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	0.2		
UNDERGRATE PRESSURE, "H_2O	1.1	1.0	0.9		
FURNACE PRESSURE, "H_2O	-.1	-.08	-0.1		
LER OUTLET PRESSURE, "H_2O	-1.2	-1.2	-1.2		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.6	-5.6	-5.8		

Sheet 2 of 3

KVB

TEST NUMBER	17				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	176	176	179		
STEAM PRESSURE, PSIG	136	136	137		
CONTROLS					
COAL/AIR RATIO	92	93	90		
BOILER LOAD	90	91	83		
COAL FEEDER BIAS	88	88	80		
FD FAN	100	100	100		
OFA FAN	94	94	92		
ID FAN DAMPER	28	29	28		
FEEDWATER	76	74	70		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	20"				
REAR UPPER OFA	21"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	3"	3"	3"		
Temp F.D. Fan – Dry	75°F				
Wet	58°F				
RH	27%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr [illegible]
% Design Capacity 50
Coal D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	18				
DATE	3-18-79				
DESCRIPTION	75,000 load D				
INTEGRATOR					
STEAM FLOW	392693	392794		392913	
TIME OF READING	930	1040	11 52	12 04	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	75	75	74		
AIR FLOW, RELATIVE	65	65	65		
FLUE GAS TEMP, °F	527	535	525		
STEAM HEADER PRESSURE, PSIG	135	136	136		
OPACITY, %	005	005	005		
	[illegible]				
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	0.2		
UNDERGRATE PRESSURE, "H_2O	1.1	1.1	1.1		
FURNACE PRESSURE, "H_2O	-0.05	-0.08	-0.10		
LER OUTLET PRESSURE, "H_2O	-1.1	-1.1	-1.1		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-.55	-.53	-.53		

Sheet 2 of 3

KVB

TEST NUMBER	18				
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	176	176	176		
STEAM PRESSURE, PSIG	137	138	138		
CONTROLS					
COAL/AIR RATIO	88	84	87		
BOILER LOAD	78	77	70		
COAL FEEDER BIAS	76	78	70		
FD FAN	99	99	99		
OFA FAN	90	86	88		
ID FAN DAMPER	28	26	26		
FEEDWATER	72	72	73		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	21"				
REAR UPPER OFA	21"				
REAR LOWER OFA	21"				
FURNACE					
ASH BED DEPTH, INCHES	3"	3"			
Temp F.D fan Tdry	74°F				
Twet	55°F				
RH	29%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 12,449
% Design Capacity 16.6
Coal D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	19				
DATE	3-13-79				
DESCRIPTION	16.6%				
	capa D				
INTEGRATOR					
STEAM FLOW	392971	[illegible]	39,4[illegible]7	3930[illegible]	
TIME OF READING	14:27	15:32	16:13	16:34	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	14	14	14		
AIR FLOW, RELATIVE	24	24	24		
FLUE GAS TEMP, °F	326	3[illegible]	3[illegible]		
STEAM HEADER PRESSURE, PSIG	141	141	141		
OPACITY, %	007	020	005		
	[illegible]	[illegible]	[illegible]		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.1	.1	0.2		
UNDERGRATE PRESSURE, "H_2O	-.3	-.3	-.4		
FURNACE PRESSURE, "H_2O	-.15	-.15	-.20		
LER OUTLET PRESSURE, "H_2O	-.3	-.4	-.4		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-1.2	-1.2	-1.2		

Sheet 2 of 3

KVB

TEST NUMBER					
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	172	172	172		
STEAM PRESSURE, PSIG	139	138	138		
CONTROLS		--			
COAL/AIR RATIO	17	17	18		
BOILER LOAD	57	– 60	– 58		
COAL FEEDER BIAS	56	59	58		
FD FAN	32	30	30		
OFA FAN	16	17	17		
ID FAN DAMPER	30	32			
FEEDWATER	40	40	40		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	5"				
REAR UPPER OFA	5"				
REAR LOWER OFA	5"				
FURNACE					
ASH BED DEPTH, INCHES	3"	3" [illegible]			
	Clinkers smoky				
Temp of FD fan T dry	77°F				
T wet	58°F				

RH 30%

Sheet 1 of 3

KVB

Steam Flow, lb/hr 58,286
% Design Capacity 77.7
Coal D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	20				
DATE	3-21-79				
DESCRIPTION	SASS/SOX				
	COAL D				
INTEGRATOR					
STEAM FLOW	395665	395737	397696	39685	
TIME OF READING	10 04	11 45	13:34	14:49	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	65	70	60		
AIR FLOW, RELATIVE	50	64	53		
FLUE GAS TEMP, °F	465	520	485		
STEAM HEADER PRESSURE, PSIG	138	139	138		
OPACITY, %	005	005	005		
BLK	white		white		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.3	0.7	0.3		
UNDERGRATE PRESSURE, "H_2O	0.7	1.5	1.4		
FURNACE PRESSURE, "H_2O	-.1	-.05	-.05		
LER OUTLET PRESSURE, "H_2O	-.16	-.18	.1		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-.40	-.43	-.47		

Sheet 2 of 3

KVB

TEST NUMBER					
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	175	173	174		
STEAM PRESSURE, PSIG	133	137	138		
CONTROLS					
COAL/AIR RATIO	66	86	77		
BOILER LOAD	74	82	64		
COAL FEEDER BIAS	76	82	64		
FD FAN	82	99	90		
OFA FAN	70	90	80		
ID FAN DAMPER	18	27	27		
FEEDWATER	63	70	66		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	19"				
REAR UPPER OFA	19"				
REAR LOWER OFA	19"				
FURNACE					
ASH BED DEPTH, INCHES	3" [illegible]	3"	3" [illegible]		
FD fan Tdry	73°F				
Twet	57°F				
RH	40				

Sheet 3 of 3

KVB

NOTES

TEST NO: 20 Load 10 to 12 - 60 to 65,000 lbs/hrs.

12 to 1330 - 50,000 lbs/hr

1330 to 1400 - 65-70,000 lbs/hr

14 to 1500 - 55,000 lbs/hr

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Sheet 1 of 3

KVB

Steam Flow, lb/hr 61,780
% Design Capacity 82.4
Coal D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	22				
DATE	3-23-79				
DESCRIPTION	PART - SWING LOAD				
INTEGRATOR					
STEAM FLOW	348125	348213		348274	
TIME OF READING	10:12	11:22	11:50	1215	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	67	70	57		
AIR FLOW, RELATIVE	62	64	55		
FLUE GAS TEMP, °F	510	513	470		
STEAM HEADER PRESSURE, PSIG	138	138	138		
OPACITY, %	005	005	005		
	white	white	white		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.1	0.1		
UNDERGRATE PRESSURE, "H_2O	1.1	1.1	0.9		
FURNACE PRESSURE, "H_2O	-.10	-0.08	- 0.10		
ILER OUTLET PRESSURE, "H_2O	-1.0	-1.0	-1.0		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-5.0	-5.3	-4.5		

Sheet 2 of 3

KVB

TEST NUMBER					
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	179	175	174		
STEAM PRESSURE, PSIG	139	13[illegible]	139		
CONTROLS					
COAL/AIR RATIO	76	82	67		
BOILER LOAD	62	70	60		
COAL FEEDER BIAS	63	70	60		
FD FAN	94	99	86		
OFA FAN	84	90	73		
ID FAN DAMPER	25	27	20		
FEEDWATER	62	80	66		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none	none	none		
FRONT LOWER OFA	21"	21"	21"		
REAR UPPER OFA	21"	21"	21"		
REAR LOWER OFA	21"	21"	21"		
FURNACE					
ASH BED DEPTH, INCHES	3-4"	3-4"	3-4"		
Temp FD fan Tdry	75F				
Twet	61F				
RA	46%				

Sheet 1 of 3

KVB

Steam Flow, lb/hr 56,667
% Design Capacity 75.5
Coal D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	23				
DATE	3-29-79				
DESCRIPTION	60,000				
INTEGRATOR					
STEAM FLOW	398959	399025	399089		
TIME OF READING	846	942	10:43		
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	60	59	59		
AIR FLOW, RELATIVE	57	56	56		
FLUE GAS TEMP, °F	490	480	470		
STEAM HEADER PRESSURE, PSIG	138	138	138		
OPACITY, %	005 white	005	005		
DRAFT GAUGES					
WINDBOX PRESSURE, "H_2O	0.2	0.2	.0.2		
UNDERGRATE PRESSURE, "H_2O	0.9	0.8	0.8		
FURNACE PRESSURE, "H_2O	-0.10	-0.1	-0.10		
LER OUTLET PRESSURE, "H_2O	-1.0	-1.0	-1.0		
PRIMARY COLLECTOR OUT PRESSURE, "H_2O	-4.5	-4.4	-4.5		

Sheet 2 of 3

KVB

TEST NUMBER					
PRESSURE GAUGES					
FEEDWATER PRESSURE, PSIG	171	171	170		
STEAM PRESSURE, PSIG	139	139	139		
CONTROLS					
COAL/AIR RATIO	72	72	72		
BOILER LOAD	60	58	57		
COAL FEEDER BIAS	60	61	58		
FD FAN	80	90	88		
OFA FAN	76	74	74		
ID FAN DAMPER	22	20	20		
FEEDWATER	66	66	66		
OVERFIRE AIR TAPS					
FRONT UPPER OFA	none				
FRONT LOWER OFA	19" H_2O		19"		
REAR UPPER OFA	19" H_2O		19"		
REAR LOWER OFA	19" H_2O		19"		
FURNACE					
ASH BED DEPTH, INCHES	2½-3" ok	2½-3" ok	2½-3"		
TEMP FD FAN T_{DRY}	69°F				
T_{WET}	65°F				
RH	82%				

KVB

1 of 3

LOAD 58,690 lbs/hr
% 78.3%
COAL D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMBER	24				
DATE	3-24-79				
DESCRIPTION	60000 lb/hr				
	Low OFA				
INTEGRATOR					
STEAM FLOW	399222	399248	399356	399367	
TIME OF READING	14:23	1526	16:20	16:29	
CHART RECORDINGS					
STEAM FLOW x 1000 lb/hr	60	59	59		
AIR FLOW, RELATIVE	54	55	55		
FLUE GAS TEMP, °F	475	475	480		
STEAM HEADER PRESSURE, PSIG	137	137	137		
OPACITY	grayish white				
DRAFT GAUGES					
WINDBOX PRESSURE, "H₂O	0.2	0.1	0.1		
UNDERGRATE PRESSURE, "H₂O	0.8	0.8	0.8		
FURNACE PRESSURE, "H₂O	-0.1	-0.1	-0.1		
BOILER OUTLET PRESS, "H₂O	-1.0	-1.0	-1.0		
PRIMARY COLLECTOR OUTLET PRESSURE, "H₂O	-4.2	-4.2	-4.1		

Sheet 2 of 3

KVB

PRESSURE GAUGES					
FEEDWATER PRESS, PSIG	176	176	175		
STEAM PRESSURE, PSIG	138	138	139		
CONTROLS					
COAL/AIR RATIO	72	70	70		
BOILER LOAD	66	62	62		
COAL FEEDER BIAS	64	64	64		
FD FAN	86	87	88		
OFA FAN	40	40	40		
ID FAN DAMPER	19	20	20		
FEEDWATER	65	66	64		
OVERFIRE AIR TAPS					
FRONT OFA	12"				
REAR UPPER OFA	12"				
REAR LOWER OFA	12"				
FURNACE					
ASH BED DEPTH, INCHES	3" 8" at #3 feeder	3"	3" OK		
TEMPERATURE FD FAN Tdry	76 °F				
Twet	64 °F				
RH	52%				

1 of 3

KVB

LOAD 74,645 lbs/hr
% 99.5 %
COAL D

PANEL BOARD DATA
ABMA TEST SITE G

TEST NUMER	25				
DATE	3-25-79				
DESCRIPTION	VARY AIR 75,000				
INTEGRATOR					
STEAM FLOW	349731			399892	
TIME OF READING	7:39			9:29	
CHART RECORDINGS					
STEAM FLOW x 1000 lbs/hr	74	75 75	75		
AIR FLOW, RELATIVE	66	65 60	56		
FLUE GAS TEMP, °F	530	530 518	502		
STEAM HEADER PRESS, PSIG	137	137 137	137		
OPACITY	whiteish				
DRAFT GAUGES					
WINDBOX PRESS. " H_2O	.2	.2 .2	.2		
UNDERGRATE PRESS " H_2O	1.0	1.0 .9	.8		
FURNACE PRESS " H_2O	-.10	-.10 -.10	-.10		
BLR OUT PRESS " H_2O	-1.1	-1.1 -1.0	-1.0		
PRIMARY COLLECTOR OUT PRESS " H_2O	-5.6	-5.5 -4.8	-4.4		

Sheet 2 of 3

KVB

PRESS. GAUGES					
FEEDWATER PRESS PSIG	173	173 173	173		
STEAM PRESS PSIG	139	139 139	139		
CONTROLS					
COAL/AIR RATIO	89	92/85 90/70	90/70		
BOILER LOAD	80	70 72	76		
COAL FEEDER BIAS	78	68 72	76		
FD FAN	100	99 90	88		
OFA FAN	92	88 78	75		
ID FAN DAMPER	76	26 24	21		
FEEDWATER	80	82 82	80		
OVERFIRE AIR					
UPPER OFA FRONT	20"	20"			
REAR UPPER OFA	21"	20"			
LOWER OFA REAR	21"	20"			
FURNACE					
ASH BED DEPTH, INCHES	3"		3"		

1 of 3

PANEL BOARD DATA
ABMA TEST site G

LOAD 58,361
% 77.8
COAL D

TEST NUMBER	26				
DATE	3-25-79				
DESCRIPTION	VARY AIR				
	60,000				
INTEGRATOR					
STEAM FLOW	349906				400017
TIME OF READING	940				11.17
CHART RECORDINGS					
STEAM FLOW x1000 lbs/hr	61	60	59	60	
AIR FLOW, RELATIVE	57	54	51	45	
FLUE GAS TEMP, °F	490	485	470	452	
STEAM HEADER PRESS PSIG	139	139	139	139	
OPACITY	whitish/brownish				
DRAFT GAUGES					
WINDBOX PRESS "H2O	.2	.2	.2	.2	
UNDERGRATE PRESS "H2O	.7	.7	.6	.6	
FURNACE PRESSURE "H2O	-.10	-.10	-.10	-.10	
BLR OUTLET PRESS "H2O	-1.0	-.09	-.08	-.07	
PRIMARY COLLECTOR OUTLET PRESS "H2O	-4.4	-4.0	-3.5	-3.0	

Sheet 2 of 3

KVB

PRESS GAUGES					
FEEDWATER PRESS PSIG	172	175	175	174	
STEAM PRESSURE PSIG	140	140	140	140	
CONTROLS					
COAL/AIR RATIO	70/70	72/66	70/58	72/52	
BOILER LOAD	67	60	64	61	
COAL FEEDER BIAS	66	60	62	60	
FD FAN	96	84	76	72	
OFA FAN	70	70	60	55	
ID FAN	20	20	16	15	
FEEDWATER	66	66	65	65	
OVERFIRE AIR					
FRONT OFA	20"			16"	
REAR UPPER OFA	20"			16"	
REAR LOWER OFA	20"			16"	
FURNACE					
ASH BED DEPTH, INCHES	3" ok				

SECTION 2.0

PARTICULATE DATA

PAGE

2.1 Particulate Data Summary 53

2.2 Particulate Data Sheets 57

2.3 Particulate Lab Worksheets 89

PARTICULATE DATA SUMMARY
PART I

LOCATION: [illegible]

Boiler Outlet   Area = 38.474 ft²

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
[illegible]	[illegible]	[illegible]	[illegible]	30.25	-0.8	0.22	[illegible]	991	[illegible]	[illegible]	[illegible]	[illegible]	9705	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	75	[illegible]		9279	
[illegible]	[illegible]				[illegible]						[illegible]	[illegible]	9530	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.8	[illegible]	[illegible]	[illegible]	[illegible]	65	[illegible]	[illegible]	10197	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		65	[illegible]		9261	
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		9407	[illegible]
8	[illegible]	[illegible]	49.4	[illegible]	-0.8	0.216	0.281	[illegible]	6.6	80	[illegible]	[illegible]	9335	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	9565	[illegible]
		[illegible]	[illegible]	[illegible]	36	[illegible]	[illegible]	[illegible]	10.2	[illegible]	[illegible]	[illegible]	9462	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			10402	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	-0. [illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		10053	[illegible]
	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9672	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9.1	[illegible]	[illegible]	[illegible]	9750	
	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	60	[illegible]	[illegible]	9791	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		9699	[illegible]

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PARTICULATE DATA SUMMARY
PART I

LOCATION: ABMA Test Site G

Multiclone Outlet AREA= 11.045 ft²

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
2	[illegible]	31.22	31.[illegible]	30.7[illegible]	[illegible]	0.752	[illegible]	[illegible]	9.9	72.38	[illegible]	.83[illegible]	9705	29.[illegible]
3	297.1	47.99	[illegible]	[illegible]	0	0.718	[illegible]	966	9.2	72	0.242	[illegible]	9279	[illegible]
4	243.[illegible]	43.[illegible]	49.3	30.16	[illegible]	0.719	0.632	[illegible]	[illegible]	73.5	0.242	[illegible]	9530	[illegible]
5	150.9	18.[illegible]	[illegible]	30.[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	31	0.242	[illegible]	10197	29.[illegible]
6	146.9	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	940	[illegible]	96	[illegible]	[illegible]	9261	[illegible]
7	930.2			[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9407	[illegible]
8	349.3	63.[illegible]	[illegible].6	30.24	0	.841	.730	[illegible]	6.9	96	.242	.837	9335	[illegible]
10	610.2	[illegible]	58.0	[illegible]	0	[illegible]	[illegible]	960	9.1	72	0.242	[illegible]	9565	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	875	15.2	72	[illegible]	[illegible]	9462	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	7.4	72	[illegible]	[illegible]	10402	29.4[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.5	[illegible]	[illegible]	[illegible]	10053	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	15.1	3.25	[illegible]	[illegible]	9072	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9.1	[illegible]	[illegible]	[illegible]	9750	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	94[illegible]	8.0	[illegible]	[illegible]	[illegible]	9791	[illegible]
[illegible]	365.[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.3	[illegible]	[illegible]	[illegible]	9699	[illegible]

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PARTICULATE DATA SUMMARY
PART II

Location ABKA Test [illegible] 5
[illegible]

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS lb/10^6BTU	EMISSIONS GR/SCF	EMISSIONS LB/HR	Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
[illegible]	[illegible]	[illegible]	[illegible]	4.271	[illegible]	763	4.9[illegible]	39.69	833	[illegible]
3	79.6	8.1	[illegible]	4.332	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	99
4	[illegible]	[illegible]	[illegible]	7.408	[illegible]	1179	[illegible]	[illegible]	[illegible]	[illegible]
5	101.7	7.8	[illegible]	6.786	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	101
6	[illegible]	11.5	[illegible]	4.171	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	2.139	0.4[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	6.6	[illegible]	2.932	[illegible]	568	7.07	[illegible]	[illegible]	[illegible]
10	[illegible]	9.7	[illegible]	6.592	2.590	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	2.265	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	5.858	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	7.5	[illegible]	4.783	2.138	930	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	2.057	[illegible]	81	[illegible]	15.83	380	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	4.720	[illegible]	[illegible]	6.6	[illegible]	[illegible]	[illegible]
	[illegible]		[illegible]	4.567	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		7.7	[illegible]	4.003	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]

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PARTICULATE DATA SUMMARY
PART II

Location FBMI Test Site G
Multiclone Outlet

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS lb/10^6BTU	GR/SCF	LB/HR	Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
[illegible]	85	4.4	high O2 [illegible]	0.222	0.085	18	4.37	63.21	405	107
[illegible]	71.6	[illegible]	low O2	0.220	0.093	19	4.52	62.64	[illegible]	[illegible]
[illegible]		[illegible]	Swing load	0.221	0.085	17	[illegible]	62.82	[illegible]	[illegible]
	[illegible]	7.6	[illegible]	0.274	[illegible]	25	4.84	65.65	[illegible]	92
[illegible]		[illegible]	normal [illegible] ✓	0.129	0.046	8	[illegible]	52.28	324	93
	[illegible]	4.2	normal [illegible]	0.353	0.208	26	2.08	[illegible]	[illegible]	95
[illegible]	[illegible]	[illegible]	[illegible] ✓	0.166	[illegible]	18	6.12	68.19	420	98
[illegible]	84.5	9.1	Swing load [illegible]	0.484	0.200	42	5.52	65.87	[illegible]	97
[illegible]	72	5.7	normal [illegible]	0.933	[illegible]	20	[illegible]	[illegible]	210	100
17	[illegible]	[illegible]	[illegible] ✓	0.364	0.158	24	544	68.65	[illegible]	[illegible]
18	[illegible]	7.6	normal [illegible]	0.320	0.142	32	6.04	70.96	432	104
19		[illegible]	normal [illegible]	0.495	[illegible]	[illegible]	1.99	2757	200	[illegible]
22		[illegible]	[illegible]	0.334	[illegible]	29	4.12	67.62	412	[illegible]
23		[illegible]	[illegible]	0.320	0.141	27	6.76	[illegible]	[illegible]	108
[illegible]			[illegible] ✓	0.260	0.122	24	6.58	62.61	[illegible]	105

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PARTICULATE

DATA

Leak Check Rate

Vac in. Hg	ft^3/min

ISOKINETICS = ________%

Sampling Time Per Point, Min

Before

After

VELOCITY TRAVERSE

TEST NUMBER 1

DATE 2-10-79

OPERATOR MJ

FUEL A

SITE G

PROBE LOCATION BLROUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		△P$_s$	△H	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	13:16	.01			526							
2		.40			550							
3		.15			508							
4		.18			455							
5		.01			504							
6		.05			540							
7		.50			527							
8		.40			441							
9		.60			515							
10		.02			496							
11		.55			549							
12		.12			495							
13		.60			520							
14		.03			526							
15		.60			523							
16		.12			416							
17		.60			507							
18		.02			527							
19		.60			527							
20		.12										
21		.01										
22		.50										
23		.24										
24		.15										
Average												

METER VOL. END ____

START ____

SAMPLE VOL. ____ ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O$_2$ = ____

Nomograph Setup

P$_{meter}$ = C =

P$_{stack}$ = T$_{stack}$ =

T$_{meter}$ = ΔP =

ΔH$_g$ = Noz(Ideal)=

% H$_2$O = Noz(Actual)=

=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	____	-	____	=	____
#2	____	-	____	=	____
#3	____	-	____	=	____
			Total		____
#4	g(End)		g(Start)		Δgrams
Silica Gel	____	-	____	=	____

Total Vol. H$_2$O ____ ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = ________ %

Sampling Time Per Point, Min

VELOCITY TRAVERSE

TEST NUMBER 1
DATE 2-10-79
OPERATOR JD
FUEL A
SITE G
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT A 1		.35			500							
2		.37			500							
3		.38			500							
4		.47			500							
5		.57			500							
6		.75			500							
7		1.20			500							
8		1.30			500							
9		1.40			500							
10		1.40			500							
11		1.1			500							
12		1.00			500							
Average		.428										

METER VOL. END ______
START ______
SAMPLE VOL. ______ ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O_2 = ______

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)=
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	______	-	______	=	______
#2	______	-	______	=	______
#3	______	-	______	=	______
			Total		______
#4	g(End)		g(Start)		Δgrams
Silica Gel	______	-	______	=	______

Total Vol. H_2O ______ ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min

ISOKINETICS = 97.7,

TEST NUMBER 2
DATE 2-11-79
OPERATOR MJ
FUEL A
SITE G
PROBE LOCATION BLR out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	—	.00	—	4354.97	500							
2	3	.44	.48	4355.48	533	370	250		200	98		3.5
3	3	.08	.09	4356.20	510	370	260		235	98		1.0
4	3	.16	.18	4357.12	—	370	280		230	98		2.0
5	3	.05	.06	4357.63	560	340	270		240	98		.08
6	3	.56	.61	4359.47	550	360	270		250	99		5.0
7	3	.12	.13	4360.36	480	365	290		240	100		2.0
8	—	.00										
9	—	.00			504							
10	—	.00			560							
11	3	.54	.59	4361.96	560	340	300		230	100		4.0
12	3	.11	.12	4362.70	—	370	310		230	100		1.5
13	—	.00										
14	—	.00			523							
15	5	.61	.67	4365.58	543	360	300		230	100		4.8
16	5	.12	.13	4366.91	528	380	310		230	100		2.0
17	—	.00										
18	—	.00										
19	5	.64	.70	4369.90	537	350	310		230	110		5.0
20	5	.10	.11	4371.20	—	370	310		220	105		2.0
21	—	.00			522							
22	5	.48	.52	4373.82	555	340	300		240	105		4.0
23	5	.24	.26	4375.64	525	370	320		260	105		3.0
24	5	.12	.13	4377.02	—	370	320		235	105		2.0
	59											
Average		.29	.319		531							

METER CORR 1.0516

METER VOL. END 4377.02
START 4354.97
SAMPLE VOL. 23.187 ft^3 ← CORR

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.0" H_2O	30.75

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .245

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	120	-	100	=	20
#2	101.5	-	100	=	1.5
#3	0	-	0	=	0
				Total	21.5
#4	g(End)		g(Start)		Δgrams
Silica Gel	149.4	-	145	=	4.4

Total Vol. H_2O 25.9 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 107.7

TEST NUMBER 2
DATE 2-11-79
OPERATOR JD
FUEL A
SITE G
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT A 1		.35	.14	4779.45	490				33	30		2.3
2		.46	.19	4780.53	500				31	31		2.5
3		.49	.20	4781.71	500				30	32		3.0
4		.52	.21	4782.94	500				30	35		3.0
5		.60	.25	4784.25	500				30	38		3.1
6		.80	.33	4785.68	500				25	40		3.[illegible]
7		1.2	.50	4787.37	340				75	75		4.5
8		1.3	.55	4789.11	500				30	40		5.0
9		1.3	.55	4790.80	500				—	—		—
10		1.3	.55	4792.51	500				—	—		—
11		1.2	.50	4794.17	500				30	50		4.5
12		1.1	.46	4795.67	400				30	50		4.0
PORT B 1		.45	.185	4796.38	500				30	65		2.5
2		.45	.185	4797.35								2.5
3		.56	.22	4798.49								3.0
4		.62	.23	4799.65								3.2
5		.65	.29	4800.89								—
6		.85	.35	4802.27								—
7	23 SCL	.97	.41	4803.91								4.6
8		.95	.40	4805.07								4.0
9		.97	.41	4806.46								—
10		.90	.38	4807.90								4.0
11		.80	.33	4808.72								3.5
12		.33	.135	4809.63								—
Average		.752	.331		480°F 940°R							

METER VOL. END 4809.63
START 4778.41
SAMPLE VOL. 31.22 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.77

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .190

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)	
#1	168	-	100	=	68	
#2	58	-	100	=		-42
#3	0	-	0	=	0	
				Total	26	
#4	g(End)		g(Start)		Δgrams	
Silica Gel	153	-	148	=	5	
				Total Vol. H_2O	31 ml	

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 99.4.

TEST NUMBER 3
DATE 2-11-79
OPERATOR MJ
FUEL A
SITE 6
PROBE LOCATION BLR

Sampling Time Per Point, Min
5

	Vac in. Hg	ft³/min
Before		
After		

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						C_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.00	—	—	545							
2		.34	.37	4379.44	530	360	300	230		100		2.1
3		.10	.11	4380.64	520	350	310	240		100		.5
4		.12	.13	4382.10	450	340	310	245		100		.5
5		.00	—	—	502							
6		.05	.06	4383.04	535	300	270	230		105		—
7		.40	.44	4385.52	550	350	270	250		105		3.0
8		.12	.13	4386.73	475	370	370	260		110		—
9		.00	—	—	500							
10		.00	—	—	510							
11		.50	.55	4389.25	560	300	300	260		110		3.0
12		.10	.11	4390.47	540	350	320	240		110		.5
13		.00	—	—	530							
14		.00	—	—	515							
15.		.50	.55	4393.00	535	325	320	280		110		3.0
16		.12	.13	4394.39	520	350	320	290		110		1.9
17		.00	—	—	510							
18		.00	—	—	545							
19		.46	.50	4396.81	560	330	330	270		115		3.0
20		.08	.09	4397.84	508	360	340	300		110		1.0
21		.00	—	—	520							
22		.44	.48	4400.36	560	340	340	280		115		3.0
23		.30	.33	4402.39	545	360	340	290		115		2.8
24		.11	.12	4403.53	450	370	340	290		115		1.5
Average		.249	.273	—	520°F 980°R							

Nomograph Setup

METER VOL. END 4403.53
START 4377.23
SAMPLE VOL. 26.30 ft³ - 27.65 CORR

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.0" H2O	30.70

Percent O_2 =

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .245

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	129.5	-	100	=	29.5
#2	102.5	-	100	=	2.5
#3	0	-	0	=	0
				Total	32
#4	g(End)		g(Start)		Δgrams
Silica Gel	136.4	-	130.3	=	6.1
				Total Vol. H_2O	38.1 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 107 %

Sampling Time Per Point, Min
5

TEST NUMBER 3

DATE 2-[illegible]

OPERATOR J.[illegible]

FUEL 4

SITE

PROBE LOCATION S[illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port B 1		.44	.50	4821.49	520	70			30	40		3.5
2		.44	.50	4823.17	–	–			–	–		3.5
3		.50	.55	4824.90	–	–			–	–		3.[illegible]
4		.58	.65	4826.75	520	72			55	60		4.2
5		.65	.74	4828.77	500	80			43	60		5.0
6		.73	.82	4830.55	500	90			42	60		5.2
7		.70	.79	4832.88	500	87			42	60		5.0
8		.75	.85	4834.88	500	70			42	61		5.0
9		.80	.90	4837.01	500	70			41	61		5.4
10		.67	.76	4838.01	500	70			40	63		4.8
11		.55	.62	4840.81	500	70			50	70		4.4
12		.44	.50	4842.46	–	70			50	70		3.8
Port A 1		.30	.34	4843.89	520	50			35	65		3.5
2		.40	.45	4845.46	520	80			32	70		4.0
3		.40	.45	4846.00	520	85			40	65		4.0
4		.46	.52	4848.63	520	90			40	68		4.5
5		.51	.57	4850.45	520	90			40	70		5.[illegible]
6		.70	.79	4852.46	520	92			40	70		6.0
7		1.1	1.2	4854.90	520	90			40	70		9.5
8		1.3	1.5	4857.64	520	91			37	70		11.0
9		1.3	1.5	4860.43	520	95			39	70		11.0
10		1.3	1.5	4863.21	520	98			38	72		11.0
11		1.2	1.4	4865.86	500	98			30	70		1.0
12		1.0	1.1	4868.09	380	90			30	70		7.5
	72											
Average		0.7175	0.8125		500°F 960°R							

METER VOL. END 4868.09

START 4820.10

SAMPLE VOL. 47.99 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.70

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = 4.3 Noz(Actual)= .242

v_s = 62.70 ft/sec =

0.212 lb/mega BTU

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	112	-	100	=	12
#2	120	-	100	=	20
#3	4	-	0	=	4
				Total	36
#4	g(End)		g(Start)		Δgrams
Silica Gel	153.0	-	139.7	=	13.3
				Total Vol. H_2O	49.3 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft³/min

Before

After

Sampling Time Per Point, Min
5

ISOKINETICS = 97 %

TEST NUMBER 4

DATE 2-15-79

OPERATOR K, T

FUEL 4

SITE

PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0		4405.07	491							
2		.34	.37	4407.34	526	350	310	235		110		2.2
3		.09	.1	4408.47	504	350	310	245		110		.90
4		.14	.15	4409.83	500	350	310	245		110		1.0
5		0			470							
6		.05	.06	4410.78	540	310	310	245		120		.50
7		.56	.62	4413.56	555	350	320	255		120		3.0
8		.14	.15	4414.43	515	350	330	260		120		1.5
9		0			510							
10		0			500							
11		.5	.55	4417.52	540	310	310	235		125		3.0
12		.10	.11	4418.64	500	350	300	240		125		.9
13		0			520							
14		0			497							
15		.5	.55	4421.28	530	320	300	240		130		3.0
16		.1	.11	4422.47	470	340	310	240		125		.9
17		0			500							
18		0			530							
*19	5:30	.56	.59	4425.42	560	310	310	240		125		3.0
20		.09	.1	4426.48	500	320	310	240		130		.9
21		0			496							
22		.40	.44	4428.99	563	300	310	250		140		3.0
23		.28	.31	4430.76	502	320	305	235		130		2.0
24		.12	.13	4432.12	500	325	305	220		130		1.5
	75.5											
Average		.266	.321		492°F 952°R							

METER VOL. END 4432.12
START 4405.07
SAMPLE VOL. 27.05 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.27

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔHg = Noz(Ideal)=

% H_2O = 6.3 Noz(Actual)=

=

8.15 lb/mega BTU

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	130	-	100	=	30
#2	103	-	100	=	3
#3	0	-	0	=	0
				Total	33
#4	g(End)		g(Start)		Δgrams
Silica Gel	158.3	-	152.7	=	5.6
				Total Vol. H_2O	38.6 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = ______ %

Sampling Time Per Point, Min
3

TEST NUMBER 4
DATE 2-16-79
OPERATOR JD
FUEL A
SITE G
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port A 1		.35	.36	4881.74	490	60	120		40	50		3.2
2		.35	.36	4883.19	490	80	130		46	50		3.2
3		.35	.36	4884.58	495	83	150		41	52		3.2
4		.42	.44	4886.19	495	82	160		45	52		3.5
2.2 10 min change → 5	+1 min	.58	.49	4888.36	510	50	200		40	50		3.8
6		.65	.55	4890.12	510	70	210		45	50		4.1
7		1.1	.95	4892.30	510	80	210		46	50		6.2
8		1.3	1.1	4894.71	500	80	210		50	50		7.3
9		1.2	1.0	4896.98	500	80	210		51	50		6.5
2.1 min change → 10		1.3	1.10	4899.29	490	50	240		48	50		7.0
11		1.2	.96	4901.51	—	70	250		50	50		6.8
12		.93	.83	4903.61	480	80	250		50	50		6.0
Port B 1		.35	.31	4904.02	480	60	260		45	51		3.5
2		.47	.41	4906.51	480	80	275		48	50		3.6
3	+30 sec	.53	.47	4908.40	480	80	280		50	50		4.0
4		.57	.50	4910.08	480	80	280		50	52		4.2
5		.60	.54	491	480	80	290		51	55		4.5
6		.67	.60	491	485	82	290		58	58		4.8
7		.72	.65	491	490	82	300		58	58		5.1
8		.67	.60	491	490	80	300		60	58		4.8
9		.75	.66	491	490	80	300		60	60		5.0
10		.75	.66	49	500	80	300		60	60		5.0
11		.68	.61	4922.11	—	75	300		60	60		4.8
12		.75	.66	4923.85	—	70	300		60	60		5.1
Average		.719	.632		494°F 954°R							

METER VOL.	
END	4923.85
START	4880.28
SAMPLE VOL.	43.57 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.26

Percent O_2 =

Nomograph Setup

P_{meter} =
C =
P_{stack} =
T_{stack} =
T_{meter} =
ΔP =
ΔH_g =
Noz(Ideal)=
% H_2O = 4.8
Noz(Actual)= .242
v_s = 62.82
=

0.217 lb/mega BTU

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	118	-	100	=	18.0
#2	116	-	100	=	16.0
#3	2.5	-	0	=	2.5
				Total	36.5
#4 Silica Gel	g(End) 151.9	-	g(Start) 138.1	=	Δgrams 12.8
				Total Vol. H_2O	49.3 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft^3/min

Before

After

ISOKINETICS = [illegible] %

Sampling Time Per Point, Min
5

TEST NUMBER 5
DATE 2-17-7[illegible]
OPERATOR [illegible]
FUEL [illegible]
SITE [illegible]
PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		△P$_s$	△H	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0		[illegible]	[illegible]							
2	5	.40	[illegible]	[illegible]	545	3[illegible]	3[illegible]	2[illegible]		[illegible]		3.0
3		.12	.13	[illegible]	535	350	3[illegible]	[illegible]		[illegible]		1.5
4		[illegible]	[illegible]	[illegible]38.3[illegible]	5[illegible]	350	3[illegible]	240		[illegible]		[illegible]
5		0			530							
6		0			5[illegible]							
7		[illegible]	[illegible]	[illegible]	5[illegible]3	320	315	25[illegible]		100		[illegible]
8		.15	.16	[illegible]	520	320	330	240		100		1.5
9		—	—									
10	–	–	–									
11		.55	[illegible]	[illegible]5.5[illegible]	575	3[illegible]	33[illegible]	23[illegible]		[illegible]		3.5
12		.13	[illegible]	[illegible]	5[illegible]	3[illegible]	3[illegible]	25[illegible]		100		1.5
13		[illegible]			5[illegible]							
14		0			535							
15		[illegible]	[illegible]	[illegible]5007	5[illegible]	320	320	240		[illegible]		[illegible]
16		[illegible]	.15	[illegible]	5[illegible]	360	330	255		[illegible]5		[illegible]
17		0										
18		0										
19		[illegible]	[illegible]	[illegible]5[illegible]53	5[illegible]	320	340	260		[illegible]		[illegible]
20		[illegible]	.12	[illegible]55.7[illegible]	540	340	340	245		[illegible]		1.5
21		0			5[illegible]							
22		0										
23		.25	[illegible]	[illegible]	5[illegible]	3[illegible]	350	230		120		2.0
24		.12	[illegible]	[illegible]	525	340	350	250		120		1.8
Average		.32[illegible]	.3[illegible]		[illegible]							

METER VOL. END [illegible]
START
SAMPLE VOL. 2[illegible] ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.83[illegible]		[illegible]5

Percent O$_2$ =

Nomograph Setup

F$_{meter}$ = C =
F$_{stack}$ = T$_{stack}$ =
T$_{meter}$ = ΔP =
ΔH$_g$ = Noz(Ideal)=
% H$_2$O = [illegible] Noz(Actual)=
[illegible] =

[illegible]

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	13[illegible]	-	[illegible]	=	3[illegible]
#2	[illegible]3	-	[illegible]	=	3
#3	0	-	0	=	0
				Total	34
#4	g(End)		g(Start)		Δgrams
Silica Gel	[illegible]	-	[illegible]5	=	5.2
				Total Vol. H$_2$O	39.2 ml

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PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min
3

ISOKINETICS = 91 %

TEST NUMBER 5
DATE 2-17-7
OPERATOR JD
FUEL A
SITE G
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port B 1		.59	.55	4939.90	500	—						4.5
2	+30 sec	.63	.58	4940.94		80	200		20	20		4.5
3	+30 sec	.65	.60	4943.14		70	200		18	18		4.5
4		.74	.69	4945.11		60	200		20	20		5.0
5		.76	.71	4947.12		80	200		20	20		5.0
6		.65	.60	4949.08		80	190		19	19		4.5
7		1.0	.95	4951.37								5.5
8		1.0	.95	4953.65								
9		1.0	.95	4955.95		65	190		20	20		6.0
10		1.0	.95									
11												
12												
	31											
Average		.802	.753		500°F 960°R							

METER VOL. END 4955.95
START 4937.17
SAMPLE VOL. 18.78 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	1" H₂O	30.45

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O = 4.7
C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

V_s = 65.89

$\overline{P}$ = .26

.250 lb/mean Btu

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	113	-	100	=	13
#2	104	-	100	=	4
#3	0	-	0	=	
				Total	17
#4	g(End)		g(Start)		Δgrams
Silica Gel	158.4	-	154.3	=	4.1

Total Vol. H_2O 21.1 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

Vac in. Hg ft³/min

Before

After

ISOKINETICS = 105.

TEST NUMBER 6
DATE 2-17-79
OPERATOR B.C.
FUEL A
SITE G
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.00										
2		.22	.24	4461.21	490	320	300			100		2.0
3		.05	.06	4462.11	470	350	315			110		—
4		.16	.17	4463.57	450	340	320			120		—
5		.00										
6		.00										
7		.20		4465.35	480	310	350			115		1.9
8		.20		4467.05	450	330	350			110		—
9		.00										
10		.00			450							
11		.21	.23	4468.76	460	320	360			115		.9
12		.17	.19	4470.32	450	340	360			115		—
13		.00										
14		.00										
15		.27	.30	4472.26	480	370	360			120		1
16		1.2	1.3	4473.52	450	350	350			120		—
17		.00										
18		.00			475							
19		.29	.32	4475.58	500	330	350			120		1
20		.06	.07	4476.54	450	340	350			120		—
21		.00										
22		.00										
23		.29	.32	4478.58	490	340	350			120		1
24		.06	.07	4480.64	450	350	340			115		1
Average		.177	.195		466 F 926°R							

METER VOL. END 4480.64
START 4459.38
SAMPLE VOL. 21.26 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.0" H_2O	30.95

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=
=

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	114	-	100	=	14
#2	100	-	100	=	0
#3	0	-	0	=	0
				Total	14
#4	g(End)		g(Start)		Δgrams
Silica Gel	146.4	-	142.3	=	4.1
				Total Vol. H_2O	18.1 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

Sampling Time Per Point, Min
3 and 5

ISOKINETICS = 92 %

TEST NUMBER 6
DATE 2-17-79
OPERATOR JDJ MJ
FUEL A
SITE G
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port B 1		.33	.31	4971.96	450	90	130		33	70		3.0
2		.37	.35	4973.325		85	190		35	75		2.8
3		.37	.35	4974.85		70	200		35	78		2.8
4		.37	.35	4976.28		60	200		35	80		2.8
5		.42	.40	4977.71		55	225		35	80		2.8
6		.39	.37	4978.16		55	240		40	80		2.8
7		.54	.50	4980.73		55	250		40	80		3.0
8		.50	.47	4982.30		50	230		35	80		2.8
9		.50	.47	4983.84		52	255		35	80		2.8
10		.43	.41	4985.33		60	260		35	80		2.8
11		.38	.36	4986.66		55	270		35	80		2.8
12		.40	.38	4988.10		50	265		35	80		2.8
Port A 1	5↓	.21	.20	4989.82		70	200		40	85		2.0
2		.21	.20	4991.55		45	200		35	85		2.0
3		.24	.22	4993.41		60	210		34	85		2.0
4		.27	.25	4995.40		60	235		34	90		2.5
5		.35	.33	4997.11		60	235		32	70.0		2.5
6		.42	.40	4998.17								4.5
7		.76	.74	5001.38								4.5
8		.84	.79	5004.76								4.8
9		.95	.85	5008.31								4.8
10		.87	.82	5011.73								4.8
11		.77	.72	5014.96								4.8
12		.67	.63	5017.94								4.8
Average		0.452	0.456		480°							

METER VOL. END 5017.94
START 4970.63
SAMPLE VOL. 47.31 ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.45

Percent O$_2$ =

Nomograph Setup

P_{meter} =		C =	
P_{stack} =		T_{stack} =	
T_{meter} =		ΔP =	
ΔH_g =		Noz(Ideal)=	
% H$_2$O =	1.9	Noz(Actual)=	

$V_s = 50.54$ =
0.116 [illegible]

Imp.	Vol.(End)		Vol (Start)		ΔVol.(ml)
#1	164	-	100	=	64
#2	5	-	100	=	-49
#3	1	-	0	=	1
				Total	16
#4	g(End)		g(Start)		Δgrams
Silica Gel	157.0	-	152.6	=	4.4

Total Vol. H$_2$O 20.4 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 98

TEST NUMBER 7
DATE 2-25-77
OPERATOR B[illegible]
FUEL B
SITE G
PROBE LOCATION B[illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0			340							
2		.09	.65	4498.53	410	320	300	180		100		3.0
4		.03	.21	4500.83	400	350	310	170		100		
3		.02	.14	4501.26	340	340	310	190		100		-
5		0			350							
6		.014	.103	4502.47	400	320	330	180		100		
7		.08	.55	4505.14	400	240	320	210		100		3.5
8		.014	.103	4506.33	350	340	340	210		90		-
9		0			350							
10		0			340							
*11	5½	.07	.50	4509.17	400	310	330	200		110		3.5
12		.05	.35	4511.27	210	340	330	225		115		3.0
1		.07	.5	4513.71	400	330	330	200		120		3.5
16		.05	.35	4515.81	410	350	340	240		120		3.0
17		0										
18		.04	.28	4517.65	410	340	340	220		120		3.0
14		.0	.55	4520.36	410	350	340	250		120		4.0
20		.04	.28	4522.20	430	340	340	250		120		3.0
22		.10	.70	4525.15	350	320	330	230		120		5.0
23		.02	.14	4526.41	410	320	330	240		120		2.0
24		.05	.35	4528.53	150	340	330	245		120		4.0
	80½											
Average		.0515	.360		407°F 867°R							

METER VOL. END 4528.58
START 4495.62
SAMPLE VOL. 32.96 ft³ [illegible]

Cpitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.00

Percent O₂ =

Nomograph Setup

P_{meter} = C =
T_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H₂O = 2.8 Noz(Actual)=
O₂ 11.85
F .36
2.228 [illegible]

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	112	-	100	=	12
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	14
#4	g(End)		g(Start)		Δgrams
Silica Gel	154.5	-	148.3	=	6.2
				Total Vol. H₂O	20.2 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
5

ISOKINETICS = 96 %

TEST NUMBER 7

DATE 2-25-79

OPERATOR [illegible]

FUEL B

SITE 6

PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	0	0		5033.65		60	200		50	85		
2	0	0										
3	0	0										
4	5	.1	.35	5035.55		60	190		45	85		3.0
5		.14	.42	5038.34		70	200		45	85		3.2
6		.18	.49	5040.95		70	200		45	85		4.0
7		.20	.7	5044.17		75	210		45	85		5.3
8		.25	.89	5047.68		55	225		45	85		6.0
9		.30	1.1	5051.49		[illegible]	220		45	85		7.2
10		.28	.92	5055.13		60	225		45	85		7.0
11		.1	.35	5057.35		65	230		45	85		4.0
12		.15	.53	5060.15		60	230		45	85		4.9
13		.30	1.0	5063.51		70	250		45	85		8.0
14		.15	.53	5066.48		70	270		48	85		5.0
15		.40	1.4	5069.70		80	270		50	85		10.0
16		.30	1.1	5073.45		80	290		50	85		9.0
17		.10	.35	5075.68		75	260		48	85		4.0
18		.12	.37	5078.02		70	260		48	85		4.0
19		.15	.53	5080.69		-	--		-			4.2
20		.25	.90	5085.72		-			-			10.0
21		.50	1.8	5089.66		—			—			13.0
22		.40	1.4	5094.06		70	280		41	85		12.0
23		.35	1.25	5097.73		70	250		48	85		10.0
24		.35	1.25	5101.75		70	250		48	85		10.0
	105											
Average	.2411	.836		860 R								

METER VOL. END 5101.75

START 5033.65

SAMPLE VOL. 68.1 ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.24

Percent O$_2$ =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = 2.6 Noz(Actual)= .316

V_s = 34.62 =

0.450 [illegible] gm

Y - 53

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	118	-	100	=	18
#2	110	-	100	=	10
#3	0	-	0	=	0
				Total	28
#4 Silica Gel	g(End) 165.2	-	g(Start) 153.1	=	Δgrams 12.1
				Total Vol. H$_2$O	40.1 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg   ft³/min

Sampling Time Per Point, Min
5

Before

After

% KINETICS = 112 %

TEST NUMBER 3

DATE 2-15-79

OPERATOR R.C.

FUEL B

SITE [illegible]

PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0										
2		.46	.51	4547.12	580	320	280	135		90		3
3		.1	.11	4548.40	530	310	310	140		80		-
4		.24	.26	4550.31	260	330	310	210		95		2
5		0										
6		.11	.12	4551.56	550	320	310	220		90		-
7		.51	.56	4554.41	570	320	330	250		90		3
8		.11	.12	4555.64	240	355	340	250		100		-
9		0			550							
10		0										
11		.42	.46	4558.12	590	325	350	200		90		3
12		.18	.2	4558.68	190	340	350	270		100		3
13		0										
14		0										
15		.34	.38	4561.93	660	310	360	250		100		3
16		.12	.13	4563.28	240	350	350	280		100		-
17		0										-
18		.04	.05	4564.01	500	340	360	200		100		-
19		.45	.44	4566.50	700	330	350	260		110		3
20		.11	.12	4567.71	250	340	340	260		110		
21		0										-
22		.52	.57	4570.44	790	330	340	250		110		4
23		.2	.22	4572.14	670	335	340	270		105		2
24		.17	.19	4573.66	220	320	330	250		110		2
	80107											
Average		.26	.281		525 F 985 R							

METER VOL. END 4573.66
START 4544.42
SAMPLE VOL 29.24 ft³

C_pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.24

Percent O₂ =

Nomograph Setup

P_{meter} =   C =

P_{stack} = T_{stack} =

T_{meter} =   ΔF =

ΔHg =   Noz(Ideal)=

% H_2O = 7.4   Noz(Actual)= .205

V_s = 35.03

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	139	-	100	=	39
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	43
#4 Silica Gel	g(End)		g(Start)		Δgrams
	138.4	-	131.5	=	6.9

Total Vol. H_2O 49.9 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
4

ISOKINETICS = 98.

TEST NUMBER 8
DATE 2-25-79
OPERATOR NJ,JD
FUEL B
SITE 6
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.6	.55	5114.20		—	170		—	65		40
2		.6	.55	5116.43		—	—		—	75		4.0
3		.6	.55	5118.70		—	—		—	75		40
4		.67	.62	5121.16		-	-		-	75		50
5		.75	.70	5123.63		—	—		—	75		5.5
6		.55	.51	5125.85		-	200		—	75		5.0
7		.95	.88	5129.04		—	—		—	75		7.0
8		.90	.84	5131.47		80	210		45	75		7.0
9		.90	.84	5134.28		80	215		45	75		7.0
10		.91	.85	5137.08		75	230		45	75		7.0
11		.85	.79	5139.78		80	230		45	70		6.5
12		.75	.70	5142.33		75	210		45	75		6.0
13		.61	.57	5144.60		50	170		40	75		40
14		.62	.58	5146.92		70	170		40	75		4.2
15		.59	.55	5149.23		70	170		40	75		4.0
16		.7	.65	5151.71		75	170		40	75		5.0
17		.83	.76	5154.38		80	175		42	75		60
18		.90	.84	5157.21		80	175		45	75		6.5
19		1.2	1.1	5160.27		—	—		—	75		7.0
20		1.2	1.1	5163.33		—	-		-	—		7.5
21		1.2	1.1	5166.37		-	—		—	—		7.5
22		1.1	1.0	5169.43		-	-		—	—		7.5
23		1.1	1.0	5172.62		—	-		—	—		7.8
24		1.1	1.0	5175.63								1.8
	96											
Average		.841	.730		500°F 960R							

METER VOL. END 5175.63
START 5111 .95
SAMPLE VOL. 63.68 ft^3 corr

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.24

Percent O_2 =

Nomograph Setup

P_{meter} =
C =
P_{stack} =
T_{stack} =
T_{meter} =
ΔP =
ΔH_g =
Noz(Ideal) =
% H_2O = 5.8
Noz(Actual) = .245
V_s = 68.24
P = 2.0

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	152	-	100	=	52
#2	107	-	100	=	7
#3	15	-	0	=	15
				Total	74
#4	g(End)		g(Start)		Δgrams
Silica Gel	170.7	-	156.1	=	14.6

Total Vol. H_2O 88.6 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Before

After

Leak Check Rate

Vac
in. Hg ft^3/min

ISOKINETICS = [illegible] %

TEST NUMBER [illegible]
DATE 3-2-[illegible]
OPERATOR B.C.
FUEL A
SITE G
PROBE LOCATION BLK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0			460							
2		.34	.45	4582.[illegible]	430	310	340	220		120		40
3		.13	.14	[illegible]	530	330	330	215		124		–
4		.25	.27	[illegible]	500	340	340	230		[illegible]		20
5		0			460							
6		.18	.20	[illegible]	510	300	340	230		110		20
7		.41	.50	[illegible]	540	360	340	250		115		3.5
8		.14	.15	4588.62	510	350	340	210		120		–
9		0										
10		0			530							
11		.36	[illegible]	4590.76	530	330	330	200		[illegible]		30
12		.31	.34	4592.78	510	340	320	230		125		30
13		0			460							
14		0			480							
15		.21	.23	4594.50	490	340	310	160		120		20
16		.14	.21	4596.04	420	320	300	215		125		20
17		0										–
18		.53	.54	4598.54	520	340	305	200		130		40
20		.14	.15	4599.84	380	350	330	220		140		
21		0										
22		.16	.18	[illegible]	350	350	300	210		140		20
23		.46	.5	4603.58	430	340	310	240		140		40
24		.16	.18	[illegible]	500	340	310	240		140		20
	75											
Average		0.275	[illegible]		517 F 977 R							

METER VOL. END 4604.89
START 4577.65
SAMPLE VOL. 27.24 ft^3 [illegible]

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.04

Percent O_2 =

Nomograph Setup

F_{meter} = C =
T_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = 2.7 Noz(Actual)= .186
[illegible] =
[illegible]

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	132	-	100	=	32
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	34
#4	g(End)		g(Start)		Δgrams
Silica Gel	143.[illegible]	-	138.2	=	5

Total Vol. H_2O 39 ml

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PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 97 %

Load Start [illegible]

[illegible]

TEST NUMBER 16

DATE 3-2-7[illegible]

OPERATOR [illegible]

FUEL 4

SITE [illegible]

PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.45	.42	5205.92	500	90	200		55	70		
2		.52	.49	5207.45		100	200		55	72		
3		.60	.56	5209.15		100	220		55	72		
4		.65	.61	5210.88		110	210		55	72		
5		.72	67	5212.74		110	200		55	75		
6		.82	.7[illegible]	5214.65		110	210		55	75		
7		1.2	1.	5216.92		100	190		[illegible]	79		
8		1.3	1.2	5219.28		100	195		55	75		
9		1.3	1.2	5221.65		100	185		60	75		
10		1.2	1.1	5223.97		100	190		60	75		
11		.93	.87	5226.05		100	195		60	75		
12		.80	.74	5227.94		95	210		60	79		
13		.46	.37	5229.27		90	190		70	80		
14		.60	.56	5230.9[illegible]		80	200		70	79		
15		.60	.56	5232.58		90	200		65	80		
16		.72	.68	5234.4[illegible]		100	230		65	80		
17		.78	.73	5236.29		100	210		65	80		
18		.86	80	5238.25		105	250		70	80		
19		.95	.88	5240.31		110	260		70	80		
20		.86	.80	5242.26		110	260		80	85		
21		.88	83	5244.21		90	250		65	83		
22		.80	.74	52[illegible]		100	270		65	85		
23		.77	.72	5247.63		100	260		65	83		
24		.40	.37	5249.26		100	270		[illegible]	85		
	72											
Average		0.796	0.74		500°F							

METER VOL. END 5249.26

START 5203.43

SAMPLE VOL. 45.83 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.04

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = 5.3 Noz(Actual)= .247

v_s = 55.94 =

434 lb

.4874

Imp.	Vol.(End)		Vol. (Start)		ΔVol (ml)
#1	143	-	[illegible]	=	43
#2	[illegible]	-	[illegible]	=	-
#3	[illegible]	-	[illegible]	=	[illegible]
				Total	[illegible]
#4	g(End)		g(Start)		Δgrams
Silica Gel	151.6	-	142.65	=	[illegible]

Total Vol. H_2O 53 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg   ft³/min

Before

After

Sampling Time Per Point, Min
5

ISOKINETICS = 104 %

TEST NUMBER [illegible]
DATE [illegible]
OPERATOR BC
FUEL [illegible]
SITE [illegible]
PROBE LOCATION BLR

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
2	5:20	.04	.28	4610.50		300	250	110		120		—
3		0										
4		.02	.14	4611.89	390	340	300	100		120		—
5		0			410							
6		0			415							
7		.06	.42	4614.29		320	270	220		110		—
8		.04	.28	4616.20		350	280	230		120		[illegible]
9		0										
10		0										
11		.09	.65	4619.04		300	290	230		120		2.8
12		.05	.36	4621.17								
13		0										
14		0										
15	6:40	.07	.50	4624.44		350	280	220		130		2.5
16		.05	.36	4626.60		340	300	220		130		[illegible]
17		0										
18		0										
19		.11	.78	4629.65		340	310	240		150		3.8
20		0										
21		0										
22		.07	.50	4632.23		330	300	220		150		3.0
23		.05	.36	4634.30		310	330	240		150		2.9
24		.03	.21	4635.35		320	330	240		150		—
	62											
Average	.0567	.403			863°R							

METER VOL. END 4635.35
START [illegible]
SAMPLE VOL. [illegible] ft³ unstand
[illegible]

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.86

Percent O₂ =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O = 3.2
M_d = [illegible]
Y = .22

C =
T_{stack} =
ΔP =
Noz (Ideal) =
Noz (Actual) = .335
=

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	125	-	[illegible]	=	5
#2	[illegible]	-	[illegible]	=	[illegible]
#3	0	-	0	=	
				Total	15
#4	g(End)		g(Start)		Δgrams
Silica Gel	152.3	-	147.5	=	4.8

Total Vol. H₂O [illegible] ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg   ft^3/min

Before

After

Sampling Time Per Point, Min
3

ISOKINETICS = 100 %

TEST NUMBER 16
DATE 3-17-79
OPERATOR JD
FUEL 4
SITE 6
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port B 1		.10	.36	5262.84	360	180	200		65	60		
2		.11	.34	5264.25	365	180	220		65	62		
3		.12	.43	5265.71	365	180	220		65	65		
4		.12	.43	5267.23	365	180	220		62	65		
5		.13	.46	5268.73	365	180	240		62	68		
6		.13	.46	5270.29	365	180	250		61	70		
7		.20	.70	5272.15	370	240	250		61	70		
8		.23	.82	5274.20	370	170	250		60	70		
9		.25	.90	5276.30	370	180	255		61	70		
10		.25	.90	5278.41	370	350	220		58	68		
11		.23	.82	5280.47	300	240	230		60	70		
12		.19	.67	5282.31	110	150	260		61	70		
Port A 1		.12	.43	5283.74	—	-	-			70		
2		.12	.43	5285.28						70		
3		.13	.46	5286.38						70		
4		.14	.50	5288.48						70		
5		.15	.54	5290.15						70		
6		.15	.54	5291.78						70		
7		.22	.78	5293.72						70		
8		.24	.85	5295.80						70		
9		.24	.85	5297.59						70		
10		.22	.78	5299.87						70		
11		.22	.78	5301.80						70		
12		.19	.67	5303.62						70		
	72											
Average		0.175	0.604		825 R							

METER VOL. END 5303.62
START 5262.84
SAMPLE VOL. 41.8 ft^3

C_{Pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.56

Percent O_2 =

Nomograph Setup

F_{meter} =   C =
P_{stack} = T_{stack} =
T_{meter} =   ΔP =
ΔHg =   Noz(Ideal)=
% H_2O = 2.2   Noz(Actual)= .31
[illegible] = 23.5   =
[illegible] = 0.53

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	108	-	100	=	8
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	12
#4 Silica Gel	g(End)		g(Start)		Δgrams
	151.8	-	142.2	=	9.6
				Total Vol. H_2O	21.6 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = [illegible] %

Sampling Time Per Point, Min
5

TEST NUMBER 17
DATE 3-11-7[illegible]
OPERATOR BC
FUEL A
SITE G
PROBE LOCATION B2R

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
2		.45	.49	4634 56	[illegible]	240	250	210		130		2.5
3		.18	.22	4641 23	520	320	275	230		[illegible]		[illegible]
4		.18	.20	4643 27		320	300	250		145		1
5		0										
6		.53	.64	4645 53	540	240	310	250		130		3
7		.38	.40	4647 82		315	320	260		[illegible]		2.5
8		.70	.77	4650.30	540	320	330	250		140		4.0
9		0										
10		0										
11		.62	.66	4653 55		300	300	260		130		3.2
12		.36	.40	4655 72		320	350	280		150		2.2
13		0										
14		0										
15		.65	.71	4658,65	560	310	360	260		150		3.5
16		.35	.38	4662 73		350	340	270		150		2.5
22		.67	.74	4664.00	600	325	350	280		170		4.0
23		.36	.40	4666.26								
24		.20	.22	4667 52		300	350	290		150		2.0
	65											
Average		.432	.470		1047 8							

METER VOL. END 4667 52
START 4631 44
SAMPLE VOL. 36 08 [illegible]

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.56

Percent O₂ =

Nomograph Setup

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔHg =
% H₂O = 5 [illegible]
C =
T$_{stack}$ =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	124	-	100	=	24
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	26
#4	g(End)		g(Start)		Δgrams
Silica Gel	16.5	-	[illegible]	=	8.5

Total Vol. H₂O 34.5 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
3

ISOKINETICS = [illegible] %

TEST NUMBER [illegible]
DATE
OPERATOR J
FUEL [illegible]
SITE [illegible]
PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port A 1		.62	.57	5309.96	547					80		
2		.63	.58	5311.57						80		
3		.63	.58	5313.27						80		
4		.75	.70	5315.15						80		
5		.79	.74	5316.12						80		
6		.89	.83	5319.12						80		
7		.90	.84	5321.12						80		
8		1.21	1.1	5323.39						80		
9		1.30	1.2	5325.75						80		
10		1.30	1.2	5328.18						80		
11		1.30	1.2	5330.44						80		
12		.70	.65	5332.35						80		
Port B 1		.62	.57	5334.05						80		
2		.68	.64	5335.81						80		
3		.73	.68	5337.63						80		
4		.75	.72	5339.48						80		
5		.87	.82	5341.51						80		
6		.95	.89	5343.52						80		
7		1.0	.92	5345.67						80		
8		1.0	.92	5347.32						80		
9		.95	.87	[illegible]						80		
10		.95	.87	5352.00						80		
11		.90	.84	5354.05						80		
12		.82	.76	5355.84						80		
	72											
Average	0.831	.820			[illegible]							

METER VOL. END 5355.84
START 5308.32
SAMPLE VOL. 47.52 ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.56

Percent O$_2$ =

Nomograph Setup

P$_{meter}$ = C =
P$_{stack}$ = T$_{stack}$ =
T$_{meter}$ = ΔP =
ΔHg = Noz(Ideal)=
% H$_2$O = 5.2 Noz(Actual)=
V$_s$ = 68.75 =
T = 2.0

78

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	[illegible]	-	[illegible]	=	[illegible]
#2	[illegible]	-	[illegible]	=	[illegible]
#3	[illegible]	-	[illegible]	=	[illegible]
				Total	[illegible]
#4 Silica Gel	g(End) 153.0	-	g(Start) 144.[illegible]	=	Δgrams [illegible]

Total Vol. H$_2$O [illegible]

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 100 %

Sampling Time Per Point, Min
5

TEST NUMBER 18
DATE [illegible]
OPERATOR [illegible]
FUEL [illegible]
SITE [illegible]
PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		△P_s	△H	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0										
2		.40	.40	4672.35	540	240	200	190		90		3
3		.10	.11	4673.64	520	330	280	270		100		—
4		.20	.22	4675.47	500	320	300	230		110		2
5		0										
6		.05	.06	4676.42	540	300	310	240		110		4
7		.67	.74	4679.48	550	310	315	200		120		—
8		.14	.15	4680.77	440	310	330	250		120		
9		0										
10		0										
11		.58	.64	4683.59	550	300	330	240		125		3.5
12		.11	.12	4684.59	480	330	335	260		130		—
13		0										
14		0										
15		.67	.74	4687.90	560	310	320	235		130		4.0
16		.13	.14	4689.33								
17		0										
18		0										
19	5½	.74	.82	4692.73	575	310	310	220		140		4.8
20		.11	.12	4694.05		330	320	240		140		—
21		0										3.5
22		.52	.57	4696.68	560	315	315	240		140		
23		.28	.31	4698.72	550	320	320	240		140		2.5
24		.13	.14	4700.10	520	330	320	240		140		—
Average		.32	.35		532							

METER VOL. END
START 46[illegible]82
SAMPLE VOL. 31542 ft³ [illegible]

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.0 H_2O	30.52

Percent O₂ =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = 6.7 Noz(Actual)=
[illegible] = 42 [illegible] =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	138	-	100	=	38
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	42
#4	g(End)		g(Start)		Δgrams
Silica Gel	144.4	-	141.4	=	7

Total Vol. H_2O [illegible] ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
3

ISOKINETICS = 101.2

TEST NUMBER 18
DATE 3-18-79
OPERATOR RAP
FUEL B
SITE 6
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
S-1	9:30	.57	.72	5362.97	—	METER TEMPS - OUT						6.5
S-2		.70	.88	5364.07	518						*	7.6
3		78	.90	5366.16	—							—
4	3.5'	.96	1.10	5368.83	519							9.4
5		.86	1.02	5371.09	—							9.0
6		1.1	1.23	5373.482	—							10.3
7		1.15	1.30	5375.00	—							11.2
8		1.1	1.23	5378.42	—							10.8
9		1.1	1.23	5380.82	517							10.4
10		1.05	1.20	5383.26	—							10.7
11		1.05	1.20	5385.67	—							—
12		.32	.36	5387.080	—							4.2
E-1	10:35	.49	.55	5388.70	—							5.3
-2		.53	.59	5390.42	519							5.7
3		.64	.72	5392.31	—							6.7
4		.62	.70	5394.15	—							6.6
5		.68	.76	5396.07	—							7.0
6		.83	.92	5398.20	—							8.2
7		1.20	1.32	5400.63	519						*	11.2 *
8		1.20	1.32	5403.11	—							11.2
9		1.20	1.32	5405.52	—							11.3
10		1.25	1.37	5407.04	519							12.0
11	4.0'	1.20	1.32	5411.31	—							11.7
12		1.05	1.15	5413.611	—							10.6
Average		.90	1.01	52.538	519							

* RESET NOMO 1.6

METER VOL. END 5413.611
START 5361.073 - TOP
SAMPLE VOL. 52.538 ft^3

$C_{p,tot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	~~-0~~ -.49" H_2O	30.52

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = 6.6 Noz(Actual)= .245
V_s: 70.44 ▼ = 1.65
★ 1.70

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	150	-	100	=	50
#2	110	-	100	=	10
#3	1	-	0	=	1
				Total	
#4	g(End)		g(Start)		Δgrams
Silica Gel	161.4	-	147.5	=	11.9
				Total Vol. H_2O	72.9 ml

PARTICULATE

DATA

Leak Check Rate

Sampling Time Per Point, Min		Vac in. Hg	ft³/min
5	Before		
	After		

ISOKINETICS = 96.6

TEST NUMBER 19
DATE 3-18-79
OPERATOR RAP
FUEL D
SITE G
PROBE LOCATION BLR exit

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT # 1 1	11:23	.09	.58	4714.54	420	320	280		90	128		3.5
2		0.00										
3		.03	.20	4715.71	400	320	315		98	130		<2.0
4		.03	.20	4716.84	380	330	320			130		<2.0
PORT # 2 5		0.00										
6		0.01	.07	4717.74	405	320	320			135		<2.0
7		.11	.75	4720.88	410	320	325			140		5.0
8		.03	.20	4721.99	390	320	325			142		<2.0
PORT # 3 9		0.00										
10		.01	.07	4722.85	400	320	305			148		<2.0
11		.09	.62	4725.63	405	320	300			150		4.3
12		.04	.27	4727.43	395	330	300			152		3.0
PORT # 4 13		.00										
14		.01	.07	4728.26	400	320	305			155		<2.0
15		.11	.75	4731.25	420	330	310			155		5.8
16		.04	.27	4733.20								
PORT # 5 17		0.00										
18		.03	.22	4734.83	420	310	300			160	*	2.5
19		.09	.74	4737.84	420	320	300			160		6.0
20		.04	.32	4739.97	395	325	300			162		3.8
PORT # 6 21		0.00										
22		.07	.56	4742.77	400	315	300			163		5.4
23		.04	.32	4745.07	410	320	305			166		4.0
24		.05	.40	4747.495	380	320	305			168		4.2
Average		.05	.367		403							

METER CORR - 1.0516

* NOMOGRAPH Change

METER VOL. END 4747.495
START 4711.702
SAMPLE VOL. 37.577 ft³ ← CORR.

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.36" H₂O	30.44

Percent O₂ =

Nomograph Setup

F$_{meter}$ = C =
F$_{stack}$ = T$_{stack}$ =
T$_{meter}$ = ΔP =
ΔHg = Noz(Ideal)=
% H₂O = 2.6 Noz(Actual)= .375
= .26
H₂ = 15.36

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	112	-	100	=	12
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	14
#4	g(End)		g(Start)		Δgrams
Silica Gel	1520	-	1512.3	=	7.7
				Total Vol. H₂O	21.7 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min
3

ISOKINETICS = [illegible] %

TEST NUMBER [illegible]
DATE [illegible]
OPERATOR [illegible]
FUEL
SITE [illegible]
PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port A 1		.12	.43	5415.6	359							3.5
2		.12	.43	5417.31								3.5
3		.14	.50	5418.85								4.0
4		.13	.47	5420.39								3.8
5	+30 sec	.14	.50	5422.25								4.1
6	+30 sec	.15	.55	5424.21								4.5
7	+15 sec	.20	.72	5426.23								
8		.22	.80	5428.2[illegible]								
9		.22	.80	5430.14								
10		.22	.80	5432.12								
11		.20	.72	5434.00								
12		.14	.50	5435.55								
Port B 1		.11	.42	5437.01								
2		.12	.43	5438.50								
3		.12	.43	5440.34								
4		.13	.47	5441.55								
5		.12	.43	5443.37								
6		.15	.55	5444.73								
7		.21	.75	5446.30								
8		.23	.81	5448.56								
9		.24	.85	5450.43								
10		.22	.80	5451.96								
11		.22	.80									
12		.03	.11	5455.22								
Average	.16	.587	[illegible]									

METER VOL. END 5455.2[illegible]
START 5414 [illegible]
SAMPLE VOL. ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O = 2.6
v_s = 21.33
ρ = .53

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .376
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	100	-	100	=	0
#2	102	-	100	=	2
#3	4	-	0	=	4
			Total		6
#4	g(End)		g(Start)		Δgrams
Silica Gel	[illegible]	-	[illegible]	=	9.[illegible]

Total Vol. H_2O 15.1 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

Vac in. Hg: [illegible] min

Before

After

ISOKINETICS = 104 %

TEST NUMBER 2

DATE [illegible]

OPERATOR [illegible]

FUEL [illegible]

SITE [illegible]

PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
2		.37	.40	4753.81	540	300	290	132		135		2
3		.12	.13	4756.41	540	340	300	130		135		–
4		.14	.15	4760.85	540	325	[illegible]	132		140		–
5		0										
6		0										
7		.57	.62	4763.69	540	315	325	130		140		3
8		.13	.16	4765.21		335	325	125		130		
9		0										
10		0										
11		.32	.40	4772.59	530	340	315	130		150		3
12		.13	.14	4775.07	440	340	320	130		150		–
13		0										
14		0										
15		.57	.63	4777.83	540	330	320	240		140		3
16		.15	.16	4778.35	530	350	340	160		150		2
17		0										
18		0										
19		.73	.80	4779.40	570	340	310	130		160		4
20		.11	.12	477?	500	350	340	130		150		–
21		0										
22		0										
23		.35	.48	4780.21	550	330	300	130		160		3
24		.15	.16	4781.61	540	350	300	130		160		2
	65											
Average		0.30	0.34		532 °F 992 °R							

METER VOL. END 4781.61

START 4753.53

SAMPLE VOL. 27.426 ft³ [illegible]

C pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.537		30.16

Percent O₂ =

Nomograph Setup

F meter = C =

F stack = T stack =

T meter = ΔP =

ΔHg = Noz(Ideal) =

% H₂O = 6.6 Noz(Actual) =

[illegible] =

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	132	-	100	=	32
#2	103	-	100	=	3
#3	0	-	0	=	0
				Total	35
	g(End)		g(Start)		Grams
#4 Silica Gel	[illegible]	-	[illegible]	=	3

Total Vol. H₂O [illegible] ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
3.0

ISOKINETICS = 102.

TEST NUMBER 22

DATE 3-23-79

OPERATOR R.A.P

FUEL D

SITE G

PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #5,	10:10	.49	.54	5472.58	500	—	270		60	62		4.8
2		.53	.57	5474.35	505	250	280		58	62		4.8
3		.61	.67	5476.18	505	285	285		60	65		5.0
4		.68	.75	5478.14	505	290	285		60	63		5.5
5		.80	.87	5480.25	505	290	290		60	65		6.2
6		.82	.87	5482.34	510	290	295		58	65		6.2
7		.90	.95	5484.52	510	270	295		59	65		7.0
8		.82	.87	5486.63	510	270	295		59	63		6.5
9		.73	.77	5488.62	485	285	295		59	62		6.0
10		.56	.60	5490.40	—	290	290		58	62		5.0
11		.68	.74	5492.35	—	285	285		58	62		5.8
12		.97	1.03	5494.62	510	290	285		58	62		7.6
EP 1		.47	.51	5496.30	510	—	250		62	65		4.7
2		.51	.55	5498.07	505	260	250		55	68		5.0
3		.51	.55	5499.75	505	280	250		55	68		5.0
4		.67	.72	5501.62	505	290	250		57	68		6.0
5		.76	.81	5503.68	510	290	250		57	68		6.5
6		.87	.95	5505.84	520	290	260		57	68		7.2
7		1.2	1.30	5508.41	520	290	270		57	69		9.7
8		1.20	1.30	5510.93	520	285	275		60	70		9.8
9		1.25	1.35	5513.50	520	300	285		60	70		10.0
10		1.35	1.45	5516.16	—	300	290		60	70		11.0
11		1.20	1.30	5518.66	—	310	300		60	72		9.8
12		.95	1.02	5520.902	—	285	295		60	72		8.2
	72											
Average		0.814	0.854		508°F 968R							

METER VOL. END 5520.902
START 5471.222
SAMPLE VOL. 49.68 ft^3

C_{Pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		30.14

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔHg = Noz(Ideal) =

% H_2O = Noz(Actual) =

V_s = 67.52 =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	126	-	100	=	26
#2	128	-	100	=	28
#3	0	-	0	=	0
			Total		34
#4	g(End)		g(Start)		Δgrams
Silica Gel	154	-	142.5	=	11.5
			Total Vol. H_2O		45.5 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 93.

TEST NUMBER 23
DATE 3-24-79
OPERATOR B.C.
FUEL D
SITE G
PROBE LOCATION Blr. Out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0										
2		.30	.33	4800.48	540	300	290	120		120		
3		.10	.11	801.65	500	325	290	220		120		—
4		.12	.13	803.06	490	320	300	230		120		—
5		0										
6		0										
7		.39	.43	805.42	530	200	250	200		125		2
8		.10	.11	806.58	390	260	280	210		125		—
9		0										
10		0										
11		.53	.58	809.32	540	360	290	190		130		3
12		.11	.12	810.52	320	340	300	230		130		—
13		0										
14		0										
15		.50	.55	813.19	520	320	310	220		130		3
16		.10	.11	814.23	440	320	310	225		130		—
17		0										
18		0										
19		.61	.67	817.12	525	310	310	215		130		3
20		.09	.010	818.28	490	320	315	230		130		—
21		0										
22		0										
23		.16	.17	819.59	520	300	320	260		130		—
24		.09	.10		490	300	315	220		130		—
	65											
Average		.246	.270		515 °F 975 R							

METER VOL. END 4819.59
START 4798.36
SAMPLE VOL 22.325 ft^3 Corr

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.70

Percent O$_2$ =

Nomograph Setup

P_{meter} =
T_{stack} =
T_{meter} =
ΔH_g =
% H_2O = 8.0
V_s: 31.54
C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) =
=

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	128	-	100	=	28
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	33
#4	g(End)		g(Start)		Δgrams
Silica Gel	151.4	-	143.6	=	7.8
			Total Vol. H_2O		40.8

PARTICULATE

DATA

Sampling Time Per Point, Min
30

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 105.

TEST NUMBER 23

DATE 3-24-78

OPERATOR RAP

FUEL D

SITE G

PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
E-1	8:36	.31	.32	5521.40	460	260	250		51	58		3.1
2		.37	.39	5522.84	470	290	250		48	58		3.7
3		.44	.46	5524.43	475	295	260		50	60		4.0
4		.56	.59	5526.25	480	295	270		51	60		4.7
5		.41	.43	5527.72	480	295	275		51	60		5.8
6		.67	.71	5529.68	490	295	285		52	60		5.2
7		1.1	1.15	5532.19	490	300	295		52	60		8.1
8		1.15	1.20	5534.69	490	295	295		52	61		8.3
9		1.15	1.20	5537.21	490	290	295		55	62		8.5
10		1.1	1.15	5539.63	—	290	305		58	62		8.2
11		1.1	1.15	5542.12	—	295	310		60	65		8.2
12		.87	.92	5544.35	—	290	310		60	63		7.0
S-1		.50	.52	5545.99	490	250	250		—	62		4.2
2		.53	.55	5547.70	490	275	270		—	62		4.7
3		.58	.62	5549.53	490	280	280		—	62		5.0
4		.66	.70	5551.44	490	295	295		—	62		5.2
5	10:53	.77	.81	5553.50	490	290	300		—	63		6.0
6		.83	.87	5555.64	490	285	310		—	63		6.3
7		.79	.84	5557.77	490	270	310		—	65		6.2
8		.67	.72	5559.72	485	265	315		—	58		5.8
9		.62	.65	5561.56	485	260	315		—	58		5.1
10		.58	.62	5563.40	—	260	310		—	68		5.0
11		.57	.60	5565.19	—	260	310		—	68		4.9
12		.51	.54	5566.878	—	265	315		—	66		4.7
Average		0.654	0.738		486°F 945 R							

METER VOL. END 5566.878

START 5520.075

SAMPLE VOL. 46.803 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.70

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = 6.8 Noz(Actual)= .245

V_s = 60.24 = 1.75

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	149	-	100	=	49
#2	110	-	100	=	10
#3	1	-	0	=	1
				Total	60
#4 Silica Gel	g(End) 152.5	-	g(Start) 141.3	=	Grams 11.2

Total Vol. H_2O 71.2 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft³/min

Before

After

Sampling Time Per Point, Min
5

ISOKINETICS = 9[illegible] %

TEST NUMBER 24

DATE 3-24-[illegible]

OPERATOR [illegible]

FUEL D

SITE [illegible]

PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0										
2		0										
3		.09	.10	4852.98	490	290	300	250		120		—
4		.11	.12	4854.29	380	320	300	240		125		—
5		0										
6		.02	.03	4854.89	520	300	290	240		125		—
7		.42	.46	4857.34	530	300	290	240		130		2
8		.10	.11	4858.51	480	320	300	240		130		—
9		0										
10		0										
11		.46	.50	4860.97	540	300	300	240		140		2.5
12		.09	.10	4862.21	400	320	310	205		140		—
13		0										
14		0										
15		.47	.52	4864.69	510	300	310	240		140		—
16		.10	.11	4865.83	380	310	310	250		140		—
17		0										
18		0										
19		.56	.62	4868.59	520	305	300	240		150		3
20		.09	.10	4869.58	280	310	320	250		150		—
21		0										
22		0										
23		.31	.34	4871.58	520	305	300	215		150		2
24		.08	.09	4872.57	490	310	300	210		150		—
	65½											
Average		.223	.246		5[illegible]°F 971.8							

METER VOL. END 4873.57 21.86 [illegible]

START 4851.78

SAMPLE VOL. 20.74 ft³ [illegible] ✓

C_Pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.48

Percent O₂ =

Nomograph Setup

P_{meter} =

P_{stack} =

T_{meter} =

ΔH_g =

% H_2O = 7.2

M_s - 33.74

C =

T_{stack} =

ΔP =

Noz(Ideal)=

Noz(Actual)=

=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	127	-	100	=	27
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	29
#4	g(End)		g(Start)		Δgrams
Silica Gel	142.3	-	135.6	=	4.8
				Total Vol. H_2O	33.8 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg   ft^3/min

Before

After

Sampling Time Per Point, Min
3

ISOKINETICS = 105.

TEST NUMBER 24
DATE 3-24-79
OPERATOR RAP
FUEL D
SITE 6
PROBE LOCATION STACK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
S-1	14:30	.56	.55	5568.84	490	230	250		60	72		4.2
2		.61	.60	5570.59	490	280	250		60	72		4.5
3		.69	.67	5572.44	490	310	250		55	65		5.0
4		.77	.75	5574.42	490	310	250		58	68		5.5
5		.78	.77	5576.43	490	295	255		55	65		5.7
6		.82	.81	5578.49	490	285	260		55	62		6.0
7		.68	.67	5580.38	490	295	265		57	62		5.1
8		.62	.61	5582.19	490	295	270		60	62		4.8
9		.55	.54	5583.87	485	280	275			65		4.5
10		.61	.60	5585.63	—	290	280			65		4.8
11		.47	.46	5587.21	—	295	285			65		4.0
12		.47	.46	5588.72	—	285	285			63		4.0
E-1		.33	.32	5590.06	480	220	220			62		3.3
2		.35	.34	5591.41	480	270	230			62		3.4
3		.37	.36	5592.79	480	280	240			62		3.6
4		.41	.40	5594.30	480	290	250			60		3.7
5		.47	.46	5595.85	480	290	250			61		4.1
6		.58	.57	5597.58	480	290	255			61		4.7
7		1.1	1.08	5600.00	485	280	265			62		8.0
8		1.1	1.08	5602.38	485	280	265			62		8.0
9		1.15	1.14	5604.81	480	275	270			62		8.3
10		1.15	1.14	5607.29	—	270	270			62		8.3
11		1.15	1.14	5609.71	—	275	275			63		8.3
12	72	1.05	1.03	5612.102	—	270	270			63		7.9
Average		0.700	.675		485°F 945R							

METER VOL. END
START 5567.858
SAMPLE VOL. 47.232 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.48

Percent O_2 =

Nomograph Setup

P_{meter} =   C =
P_{stack} = T_{stack} =
T_{meter} =   ΔP =
ΔHg =   Noz(Ideal)=
% H_2O = 6.6   Noz(Actual)=
V_s = 62.56   =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	148	-	100	=	48
#2	109	-	100	=	9
#3	2	-	0	=	2
				Total	58
#4	g(End)		g(Start)		Δgrams
Silica Gel	148.0	-	136.7	=	11.3
				Total Vol. H_2O	64.3 ml

PARTICULATE LAB WORKSHEET

TEST NO. 2 (Inlet, Outlet) LOCATION Blr

Date 2-10-79 Box No. ______ Eng. ______

Test Description Max. OF+ 60,000 lbs/hr

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#3	#1	#3		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.9807	50 2485	0 8063		
	2		95 9804	50 2983	0 8062		
	3		95 9801	50 2981	0 8065		
	4						
AVG.			95.9804	50 2983	0 8063		
POST TEST WTS.							
	1		96.6208	52 2547	0 9479		
	2		96.6208	52 2550	0 9469		
	3		96 6207	52 2543	0 9467		
	4						
AVG.			96 6208	52 2547	0.9472		
Δ WT.			0.6404	1 9564	0 1409		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 2737.7 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 2 (Inlet, Outlet) LOCATION STACK
Date 2-11-79 Box No. ____ Eng. ____
Test Description MAX. O.F.A 60,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#4	#2	#4		
BEAKER NO.							
DATE WT.							
TARE WT.	1		102.1440	49.6422	0.9591		
	2		102 1437	49.6410	0.9597		
	3		102.1435	49.6406	0.9590		
	4						
AVG.			102 1437	49.6413	0.9593		
POST TEST WTS.							
	1		102.1954	49.6469	1.0790		
	2		102.1955	49.6468	1.0782		
	3		102.1955	49.6455	1.0787		
	4						
AVG.			102.1955	49.6464	1.0786		
Δ WT.			0.0518	0.0051	0.1193		

Δ Vlc = ____ ml LOAD ____ klb/hr
Δ DgV = ____ ft^3 O_2 ____ %
Δ Mn 176.2 mgm REMARKS: ____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 3 (Inlet, Outlet) LOCATION BLR

Date 2-11-79 Box No. ____ Eng. ____

Test Description 60,000 mi off

Dry Gas Meter Vol (ft^3)

Final ____

Initial ____

Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#7	#5	#5		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.3528	50.3073	0.8440		
	2		104.3525	50.3077	0.8440		
	3		104.3524	50.3074	0.8440		
	4						
AVG.			104.3526	50.3075	0.8440		

POST TEST WTS.

	1		104.6858	53.3166	1.0184		
	2		104.6862	53.3163	1.0176		
	3		104.6855	53.3157	1.0179		
	4						
AVG.			104.6858	53.3162	1.0180		
Δ WT.			0.3332	3.0087	0.1740		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft^3 O_2 ____ %

Δ Mn 3515.9 mgm REMARKS: ____

PARTICULATE LAB WORKSHEET

TEST NO. 3 (Inlet, Outlet) LOCATION STACK

Date ______ Box No. ______ Eng. ______

Test Description 60,000 lbs/hr min OFA

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#8	#6	#6		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.5732	50.1598	0.7382		
	2		95.5735	50.1597	0.7385		
	3		95.5731	50.1595	0.7382		
	4						
AVG.			95.5733	50.1597	0.7382		
POST TEST WTS.							
	1		95.6562	50.1865	0.9262		
	2		95.6564	50.1857	0.9265		
	3		95.6557	50.1845	0.9263		
	4						
AVG.			95.6564	50.1856	0.9263		
Δ WT.			0.0831	0.0259	0.1881		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 297.1 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 4 (Inlet, Outlet) LOCATION BLR

Date 2-16-79 Box No. Eng.

Test Description swing load

Dry Gas Meter Vol (ft^3)

Final

Initial

Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#12	#16	#7		
BEAKER NO.							
DATE WT.							
TARE WT.	1		97.0268	49.6405	0.6955		
	2		97.0288	49.6404	0.6952		
	3		97.0293	49.6406	0.6954		
	4						
AVG.			97.0283	49.6405	0.6954		
POST TEST WTS.							
	1		97.3957	54.2717	0.8781		
	2		97.4245	54.2716	0.8791		
	3		97.4183		0.8791		
	4		97.4058				
AVG.			97.4111	54.2717	0.8788		
Δ WT.			0.3828	4.6312	0.1834		

Δ Vlc = ml LOAD klb/hr

Δ DgV = ft^3 O_2 %

Δ Mn 5197.4 mgm REMARKS:

PARTICULATE LAB WORKSHEET

TEST NO. 4 (Inlet, Outlet) LOCATION STACK

Date 2-16-79 Box No.______ Eng.______

Test Description Swing load

Dry Gas Meter Vol (ft^3)

Final______

Initial______

Δ DgV______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#13	#17	#8		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.4671	50.2978	0.7901		
	2		104 4609	50.2977	0.7905		
	3		104 4610	50 2973	0.7906		
	4						
AVG.				50.2976	0.7904		

POST TEST WTS.

	1		104.5163	50.3236	0.9636		
	2		104 5094	50.3235	0.9638		
	3		104.4883	50 3237	0.9637		
	4						
AVG.			104.5047	50.3236	0.9637		
Δ WT.			0.0437	0 0260	0 1733		

Δ Vlc = ______ ml LOAD______ klb/hr

Δ DgV = ______ ft^3 O_2______ %

Δ Mn 243.0 mgm REMARKS:______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 5 (Inlet, Outlet) LOCATION BLR

Date 2-17-79 Box No. ________ Eng. ________

Test Description 75,000 lbs/hr with reinjection

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#14	#20	#9		
BEAKER NO.							
DATE WT.							
TARE WT.	1		97 7704	50.3060	0.6473		
	2		97 7703	50.3069	0.6475		
	3		97.7704	50.3063	0.6473		
	4						
AVG.			97 7704	50.3064	0.6474		
POST TEST WTS.							
	1		97.9646	55.7083	0.8318		
	2		97 9643	55.7086	0.8323		
	3				0.8324		
	4						
AVG.			97 9645	55.7085	0.8322		
Δ WT.			0.1941	5.4021	0.1848		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn 5781 0 mgm REMARKS: ________

PARTICULATE LAB WORKSHEET

TEST NO. 5 (Inlet, Outlet) LOCATION STACK

Date 2-17-79 Box No. ____ Eng. ____

Test Description 75,000 lbs/hr with reinjection

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#15	#21	#10		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.0119	50.1591	0.7432		
	2		95.0121	50.1588	0.7440		
	3		95.0133	50.1591	0.7437		
	4						
AVG.				50.1590	0.7436		
POST TEST WTS.							
	1		94.9918	50.1698	0.8283		
	2		94.9952	50.1703	0.8283		
	3		94.9896	50.1704	0.8284		
	4		scale had a				
AVG.			loose weight	50.1702	0.8283		
Δ WT.			~ 0.055 estimate	0.0112	0.0847		

Δ Vlc = ____ ml

Δ DgV = ____ ft^3

Δ Mn 150.9 mgm

LOAD ____ klb/hr

O_2 ____ %

REMARKS: ____

PARTICULATE LAB WORKSHEET

TEST NO. 6 (Inlet, Outlet) LOCATION BR

Date 2-17-79 Box No. ____ Eng. ____

Test Description 45,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#18	#10	#11		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.3536	95.6496	0.6662		
	2		104.3543	95.6497	0.6662		
	3		104.3539	95.6494	0.6664		
	4						
AVG.			104.3539	95.6496	0.6663		
POST TEST WTS.							
	1		104.4573	97.8037	0.7696		
	2		104.4519	97.8031	0.7684		
	3			97.8039	0.7684		
	4						
AVG.			104.4546	97.8036	0.7688		
Δ WT.			0.1007	2.1540	0.1025		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft^3 O_2 ____ %

Δ Mn 2357.2 mgm REMARKS: ____

PARTICULATE LAB WORKSHEET

TEST NO. 6 (Inlet, Outlet) LOCATION STACK

Date 2-17-79 Box No. ______ Eng. ______

Test Description 45,000

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#19	#11	#12		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.9801	105.2098	0.7469		
	2		95.9820	105.2100	0.7468		
	3		95.9815	105.2103	0.7469		
	4						
AVG.			95.9812	105.2100	0.7469		
POST TEST WTS.							
	1		96.0254	105.2139	0.8567		
	2		96.0183	105.2133	0.8573		
	3			105.2127	0.8573		
	4						
AVG.			96.0146	105.2133	0.8571		
Δ WT.			0.0334	0.0033	0.1102		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 146.9 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 7 (Inlet, Outlet) LOCATION BLR

Date 2-25-79 Box No. ________ Eng. ________

Test Description 15,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ________
Initial ________
Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#22	#24	#13		
BEAKER NO.							
DATE WT.							
TARE WT.	1		102.1448	50.3518	0.6938		
	2		102.1476	50.3521	0.6937		
	3		102.1469	50.3523	0.6941		
	4						
AVG.			102.1464	50.3521	0.6939		
POST TEST WTS. ↕							
	1		102.2749	49.6425	0.9513		
	2			49.6423	0.9515		
	3			49.6420	0.9520		
	4						
AVG.			102.2749	49.6423	0.9516		
Δ WT.			0.1285	0.7098	0.2577		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn 1096.0 mgm REMARKS: ________

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 7 (Inlet, Outlet) LOCATION STACK

Date 2-25-79 Box No.______ Eng.______

Test Description 15,000 lbs/hr

Dry Gas Meter Vol (ft^3)

Final______

Initial______

Δ DgV______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#23	#25	#14		
BEAKER NO.							
DATE WT.							
TARE WT.	1		75.5735	50.1613	0.7901		
	2		95.5744	50.1610	0.7902		
	3		95.5739	50.1609	0.7909		
	4						
AVG.			95.5742	50.1611	0.7904		
POST TEST WTS.							
	1		96.0939	50.1864	1.1764		
	2		96.0934	50.1861	1.17658		
	3			50.1857	1.1760		
	4						
AVG.			96.0937	50.1861	1.1761		
Δ WT.			0.5195	0.0250	0.3857		

Δ Vlc = ______ ml LOAD______ klb/hr

Δ DgV = ______ ft^3 O_2______ %

Δ Mn 930.2 mgm REMARKS:______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 8 (Inlet, Outlet)
LOCATION BLR
Date 2-25-79
Box No.
Eng.
Test Description 75,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final
Initial
Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#31	#26	#15		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.1122	50.3074	0.7313		
	2		95.0128	50.3075	0.7314		
	3		95.0117	50.3073	0.7315		
	4						
AVG.			95.0122	50.3074	0.7314		
POST TEST WTS.							
	1		95.2012	52.9698	0.9212		
	2		95.2007	52.9704	0.9100		
	3		95.2007	52.9700	0.9109		
	4						
AVG.			95.2009	52.9701	0.9140		
Δ WT.			0.1887	2.6627	0.1826		

Δ Vlc = ml
Δ DgV = ft^3
Δ Mn 3034.0 mgm

LOAD klb/hr
O_2 %
REMARKS:

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 8 (Inlet, Outlet) LOCATION STACK

Date 2-25-79 Box No. ______ Eng. ______

Test Description 75,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#32	#27	#16		
BEAKER NO.							
DATE WT.							
TARE WT.	1		102.1451	50.2992	0.8225		
	2		102.1446	50.2990	0.8229		
	3		102.1446	50.2989	0.8232		
	4						
AVG.			102.1448	50 2990	0.8229		
POST TEST WTS.							
	1		102.2406	50 3140	1.0608		
	2		102.2419	50.3136	1.0608		
	3		102.2418	50 3137			
	4						
AVG.			102.2414	50 3138	1.0608		
Δ WT.			0.0966	0.0148	0.2379		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 349.3 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 10 (Inlet, Outlet) LOCATION BLR

Date 3-2-79 Box No. ______ Eng. ______

Test Description swing load

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#41	#29	#17		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.6519	49.6427	0.7321		
	2		95.6518	49.6426	0.7324		
	3		95.6523	49.6420	0.7317		
	4						
AVG.			95.6520	49.6424	0.7321		

POST TEST WTS.

		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		95.9435	54.0898	0.9183		
	2		95.9424	54.0901	0.9212		
	3		95.9428	54.0905	0.9218		
	4						
AVG.			95.9429	54.0901	0.9204		
Δ WT.			0.2909	4.4477	0.1883		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O$_2$ ______ %

Δ Mn 4926.9 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 10 (Inlet, Outlet) LOCATION Stack

Date 3-2-79 Box No.________ Eng.________

Test Description Swing

Dry Gas Meter Vol (ft^3)

Final________

Initial________

Δ DgV________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#42	#31	#18		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.4602	50.1609	0.8459		
	2		104.4605	50.1605	0.8454		
	3		104.4601	50.1604	0.8457		
	4						
AVG.			104.4602	50.1606	0.8456		
POST TEST WTS.							
	1		104.8456	50.1864	1.0430		
	2		104.8453	50.1863	1.0455		
	3		104.8450	50.1864	1.0462		
	4						
AVG.			104.8453	50.1864	1.0449		
Δ WT.			0.3851	0.0258	0.1993		

Δ Vlc = ________ ml LOAD________ klb/hr

Δ DgV = ________ ft^3 O_2________ %

Δ Mn 610.2 mgm REMARKS:________

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 16 (Inlet, Outlet) LOCATION BLR
Date ______ Box No. ______ Eng. ______
Test Description 15,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#39	#33	#19		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.9809	50.3073	0.6809		
	2		95.9810	50.3069	0.6809		
	3		95.9809	50.3064	0.6815		
	4						
AVG.			95.9809	50.3069	0.6810		
POST TEST WTS.							
	1		96.0820	50.9238	0.8490		
	2		96.0827	50.9237	0.8496		
	3		96.0816	50.9244	0.8495		
	4						
AVG.			96.0819	50.9241	0.8494		
Δ WT.			0.1010	0.6171	0.1684		

Δ Vlc = ______ ml LOAD ______ klb/hr
Δ DgV = ______ ft^3 O_2 ______ %
Δ Mn 886.5 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 16 (Inlet, Outlet) LOCATION STACK

Date ____ Box No. ____ Eng. ____

Test Description 15,000 lbs/hr

Dry Gas Meter Vol (ft³)

Final ____

Initial ____

Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H₂O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#40	#34	#20		
BEAKER NO.							
DATE WT.							
TARE WT.	1		97.7692	50.2988	0.8455		
	2		97.7691	50.2986	0.8455		
	3		97.7690	50.2987	0.8456		
	4						
AVG.			97.7691	50.2987	0.8455		
POST TEST WTS.							
	1		97.9959	50.4011	1.0514		
	2		97.9961	50.4011	1.0513		
	3		97.9959	50.4011	1.0508		
	4						
AVG.			97.9960	50.4011	1.0512		
Δ WT.			0.2269	0.1024	0.2057		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft³ O_2 ____ %

Δ Mn 535.0 mgm REMARKS: ____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 17 (Inlet, Outlet) LOCATION BLR

Date ______ Box No. ______ Eng. ______

Test Description 75,000 lbs/hr

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#45	#43	#21		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.6500	50.1600	.6406		
	2		95.6515	50.1598	.6407		
	3		95.6514	50.1596	.6410		
	4						
AVG.			95.6510	50.1598	0.6408		

POST TEST WTS.

	1		95.9276	55.1611	0.5063		
	2		95.9260	55.1606	0.8060		
	3		95.9262	55.1613	0.8057		
	4						
AVG.			95.9266	55.1610	0.8060		
Δ WT.			0.2756	5.0012	0.1652		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 5442.0 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 17 (Inlet, Outlet) LOCATION STACK

Date ______ Box No. ______ Eng. ______

Test Description 75,000 lbs/hr

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#46	#44	#22		
BEAKER NO.							
DATE WT.							
TARE WT.	1		~~102.1443~~	49.6418	0.8282		
	2		102.1474	49.6414	0.8284		
	3		102.1483	49.6415	0.8285		
	4						
AVG.			102.1479	49.6416	0.8284		
POST TEST WTS.							
	1		102.2683	49.7403	1.1139		
	2		102.2672	49.7392	1.1148		
	3		102.2677	49.7398	1.1152		
	4						
AVG.			102.2677	49.7398	1.1146		
Δ WT.			0.1198	0.0982	0.2862		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 504.2 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 18 (Inlet, Outlet) LOCATION BLR

Date ______ Box No. ______ Eng. ______

Test Description [illegible]

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#47	#35	#33		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.0129	95.5753	0.7222		
	2		95.0120	95.5742	0.7219		
	3		95.0127	95.5743	0.7220		
	4						
AVG.			95.0125	95.5746	0.7220		
POST TEST WTS.							
	1		95.2199	95	0.9122		
	2		95.2186	99.6805	0.9132		
	3		95.2182	99.6796	0.9137		
	4			99.6808			
AVG.			95.2189	99.6802	0.9132		
Δ WT.			0.2064	4.1056	0.1912		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 4503.2 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 18 (Inlet, Outlet) LOCATION MECH

Date ______ Box No. ______ Eng. ______

Test Description 75,000 lbs/hr

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			# 48	# 36	# 24		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.4593	97.0303	0.8558		
	2		104 4588	97 0297	0 8558		
	3		104.4593	97.0298	0.8558		
	4						
AVG.			104 4591	97.0299	0.8558		
POST TEST WTS.							
	1		104.5802	97,1283	1.1300		
	2		104.5805	97.1277	1.1324		
	3		104.5800	97.1282	1.1313		
	4						
AVG.			104.5802	97.1281	1.1312		
Δ WT.			0.1211	0.0982	0.2754		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 494.7 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

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PARTICULATE LAB WORKSHEET

TEST NO. 19 (Inlet, Outlet) LOCATION 5iR
Date ______ Box No. ______ Eng. ______
Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			49	37	25		
BEAKER NO.							
DATE WT.							
TARE WT.	1		105 2148	105.2129	0.7285		
	2		105. 2141	105.2126	0.7285		
	3		105 2140	105.2124	0.7286		
	4						
AVG.			105.2143	105.2126	0.7285		

POST TEST WTS.

	1						
	2		105.3148	105.8600	1.0105		
	3		105 3148	105.8607	1.0113		
	4		105.3144	105 8603	1.0110		
AVG.			105 3147	105.8603	1.0109		
Δ WT.			0.1004	0.6479	0.2824		

Δ Vlc = ______ ml LOAD ______ klb/hr
Δ DgV = ______ ft^3 O_2 ______ %
Δ Mn 1030.7 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 19 (Inlet, Outlet) LOCATION STACK

Date ____ Box No. ____ Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#50	#38	#26		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.9823	104.3553	0.8371		
	2		95,9818	104.3550	0.8371		
	3		959816	104 3551	0.8370		
	4						
AVG.			95.9819	104 3551	0.8371		
POST TEST WTS.							
	1		96.0333	104.3789	1.0004		
	2		96.0329	104.3776	1.004		
	3		96.0332	104.3775	1.0004		
	4						
AVG.			96.0331	104.3779	1.0004		
Δ WT.			0.0512	0.0228	0.1633		

Δ Vlc = ____ ml
Δ DgV = ____ ft^3
Δ Mn 2373 mgm

LOAD ____ klb/hr
O_2 ____ %
REMARKS: ____

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PARTICULATE LAB WORKSHEET

TEST NO. 22 (Inlet, Outlet) LOCATION BLR

Date Box No. Eng.

Test Description

Dry Gas Meter Vol (ft^3)

Final

Initial

Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#57	#51	#27		
BEAKER NO.							
DATE WT.							
TARE WT.	1		104.4600	50.2995	0.7215		
	2		104.4608	50.2996	0.7215		
	3		104.4602	50.2993	0.7215		
	4						
AVG.			104.4603	50.2995	0.7215		
POST TEST WTS.							
	1		104.6293	53.3980	0.8838		
	2		104.6309	53.3984	0.8865		
	3		104.6309	53.3993	0.8876		
	4						
AVG.			104.6304	53.3986	0.8860		
Δ WT.			0.1701	3.0631	0.1645		

Δ Vlc = ml

Δ DgV = ft^3

Δ Mn 3433.7 mgm

LOAD klb/hr

O_2 %

REMARKS:

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 22 (Inlet, Outlet) LOCATION MECH

Date ____ Box No. ____ Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#58	#52	#28		
BEAKER NO.							
DATE WT.							
TARE WT.	1		97.0285		09784		
	2		97.0283	49.6418	0 9784		
	3		97 0283	49.6415	0 9783		
	4			49 6416			
AVG.			97 0284	49.6416	09784		
POST TEST WTS.							
	1		97.1470	49.7048	1.2322		
	2		97.1508	49.7041	1.2357		
	3		97.1522	49.7046	1.2369		
	4						
AVG.			97.1500	49.7047	1.2349		
Δ WT.			0.1216	0.0631	0.2555		

Δ Vlc = ____ ml

Δ DgV = ____ ft^3

Δ Mn 441.2 mgm

LOAD ____ klb/hr

O_2 ____ %

REMARKS: ____

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PARTICULATE LAB WORKSHEET

TEST NO. 23 (Inlet, Outlet) LOCATION BLR

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#59	#53	#29		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.5742	102.1459	0.7264		
	2		95.5754	102.1456	0.7265		
	3		95.5748	102.1457	0.7265		
	4						
AVG.			95.5748	102.1457	0.7265		
POST TEST WTS.							
	1		95.7679	104.7056	0.8703		
	2		95.7687	104.7066	0.8720		
	3		95.7692	104.7079	0.8725		
	4						
AVG.			95.7686	104.7067	0.8716		
Δ WT.			0.1938	2.5610	0.1451		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 2899.9 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 23 (Inlet, Outlet) LOCATION MECH

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#60	#54	#30		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.0118	104.3550	0.9745		
	2		95.0120	104.3546	0.9744		
	3		95.0119	104.3550	0.9746		
	4						
AVG.			95.0119	104.3549	0.9745		
POST TEST WTS.							
	1		95.1074	104.4331	1.2226		
	2		95.1101	104.4327	1.2258		
	3		95.1107	104.4326	1.2270		
	4						
AVG.			95.1094	104.4328	1.2251		
Δ WT.			0.0975	0.0779	0.2506		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 426.0 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 24 (Inlet, Outlet) LOCATION BLR

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#61	#55	#31		
BEAKER NO.							
DATE WT.							
TARE WT.	1		95.6515	50.1604	0.7368		
	2		95.6519	50.598	0.7361		
	3		95.6513	50.1599	0.7371		
	4						
AVG.			95.6516	50.1600	0.7367		
POST TEST WTS.							
	1		95.8124	52.4478	0.8639		
	2		95.8127	52.4499	0.8658		
	3		95.8138	52.4496	0.8654		
	4						
AVG.			95.8130	52.4491	0.8650		
Δ WT.			0.1614	2.3391	0.1283		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 26288 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 24 (Inlet, Outlet) LOCATION STACK

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			#62	#56	#32		
BEAKER NO.							
DATE WT.							
TARE WT.	1		97.7696		0.9771		
	2		97.7694	50.3076	0.9770		
	3		97.7687	50.3070	0.9771		
	4			50.3072			
AVG.			97.7692	50.3073	0.9771		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		97.8816	50.3547	1.1828		
	2		97.8831	50.3550	1.1849		
	3		97.8834	50.3550	1.1844		
	4						
AVG.			97.8827	50.3549	1.1840		
Δ WT.			0.1135	0.0476	0.2069		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn 368.0 mgm REMARKS: ________

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SECTION 3.0

GASEOUS DATA

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3.1 Gaseous Emission Summary 120

3.2 Gaseous Emission Data Sheets 123

3.3 SOx Data Summary 143

3.4 SOx Data Sheets 144

GASEOUS EMISSION SUMMARY

Location: ABMA TEST SITE 6

Fuel: COAL A&B

				BLR						STACK						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
2	2-11-79	85.0	max OFA 23" H_2O	8.9	10.2		321			9.9	9.4		317			coal A
3	2-11-79	79.6	low OFA	87	10.5		380									↓
4	2-16-79	76.7	swing load	10.4	9.4		486	-8		10.0	95		477			
5	2-17-79	101.7	reinjection	7.0	12.0		350									
6	2-17-79	57.4	as found	10.5	9.4		478									
7	2-25-79	17.3	as found	14.6	4.4		364	-3		14.8	44		384			Boiler smoked at low load
8	2-25-79	99.6	as found	6.6	11.6		306	0		6.9	11.3		320			coal B
9	2-28-79	72.3	swing load - SASS	10.2	9.0		530			10.1	9.3		344	622	5	coal A [illegible]
10	3-2-79	86.0	swingload	9.7	9.8		442	3		9.1	10.6		403			↓
11 A	3-3-79	77.9	Vary O_2 ↓	8.0	11.0		402	0	19	89	10.2		455			
B				7.6	11.0		458	0	20							
C				6.7	122		358	0	23	7.3	11.4		316			
D				6.0	128		300	0	24	6.9	11.6		313			

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: ABMA TEST SITE 6

Fuel: COAL A+D

				BLR						STACK						
TEST NO.	DATE	LOAD %	CONDITIONS	O2 % Dry	CO2 % Dry	CO ppm Dry	NO ppm Dry	NO2 ppm Wet	HC ppm Wet	O2 % Dry	CO2 % Dry	CO ppm Dry	NO ppm Dry	SO2 ppm Dry	SO3 ppm Dry	NOTES
12.1	3-3-79	98.3	Vary O2	7.2	11.6		418	0	39	7.4	11.4		398			COAL A
2			↓	6.8	12.2		381	0	41	6.9	12.0		371			
3				6.1	12.4		363	0	35	6.6	12.2		350			
4				5.8	12.4		320	0	38	6.0	12.4		312			
5				5.0	13.2		304	0	39	5.8	12.8		296			
15	3-16-79	87.4	as found - swing	8.7	10.6		457	0	–	9.6	9.4		457	544	3	SASS/SOx
16	3-17-79	15.8	as found	15.2	4.6		311	0	–	15.7	4.4		4.4			↓
17	3-17-79	97.7	as found - winter fuel	9.6	11.5		347	-13	–	8.2	10.4		366			
18	3-18-79	97.1	as found	7.5	11.6		415	7	-	7.9	11.2		394			COAL D
19	3-18-79	16.6	as found	15.1	4.1		381	0	-	15.4	3.8		347			
20	3-21-79	77.7	as found swing	9.2	10.4		316	11	–	9.8	9.7		393	540	5	SASS-SOx
22	3-23-79	82.4	as found swing	9.1	10.3		414	-14		8.7	10.7		400			
23	3-24-79	75.5	High OFA	8.0	11.2		423	-41	–	9.0	10.2		406			
24	3-24-79	78.3	Low OFA	7.3	11.7		336	-57	–	8.4	11.0		365			↓

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: TEST SITE G

Fuel: COAL D

				BLR OUTLET						STACK						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
25A	3-25-79	99.5	Vary O_2	6.0	128		360			7.1	12.2		389			
B			↓	5.7	13.2		388			7.0	11.6		399			
C			↓	5.2	13.2		353			6.2	12.4		341			
D			↓	4.0	14.4		296			6.0	13.0		312			
26A	3-25-79	77.8	Vary O_2	8.0	11.4		402			8.8	11.0		399			
B			↓	7.0	12.2		348			7.6	11.8		310			
C			↓	6.0	13.2		300			7.4	11.6		305			
D			↓	5.2	13.7		265			6.3	12.8		257			

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

AFV

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 2

DATE 2-11-79

FUEL A

LOAD 60,000

CONDITIONS High OFA

DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(drv) unc	NO ppm(drv) cor	HC LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1,2,3,5,6	9:20	8.8	10.4	N.	A.	210	311									No calibration
7	9:35	9.8	9.4			190	306									drifts
7	10:20	10.0	9.5			200	328									± 5 ppm
1,2,3,5,6	10:50	9.0	10.0			220	331									will not
																return to
																span cal.
																after
																zeroing

AVERAGES

BLR	AVG.	8.9	10.2	▨		▨	321	▨		▨		▨		▨		
MECH	AVG.	9.9	9.4	▨		▨	317	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 3

DATE 2-11-79

FUEL A

LOAD 60,000

CONDITIONS low OFA

DATA TAKEN BY B.C.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
7	4:30			N.	A.											Stack
1,2,3,5,6	4:50	9.0	10.0	〃	〃	250	376									Blr. Out
1,2,3,5,6	5:15			〃	〃							0				
1,2,3,5,6	5:40	8.3	10.9	〃	〃	270	384									NO meter
																will not
																return to
																span cal
																after
																zeroing

AVERAGES

BLR	AVG.	8.7	10.5	▨		▨	380	▨		▨		▨		▨		
MECH	AVG.			▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G
TEST NO 4
DATE 2-16-79

FUEL A
LOAD Swing
CONDITIONS as found
DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1,2,3,5,6	2:25	7.8	10.7			280	452									N.
1,2,3,5,6	2:55	11.0	8.8			260	412									meter
1,2,3,5,6	3:45	12.0	7.8			255	513									calibration
7		9.3	9.6			345	532	higher load 7.8								probes now
1,2,3,5,6		10.5	9.2			310	534	end of swing								eliminated
7		10.5	9.4			275	423									Use
1,2,3,5,6		9.6	10.2			290	459	255	451				-8			opposed
7		10.2	9.4			255	427									change

AVERAGES

BLR	[illegible]	10.4	[illegible]				452						-8			
[illegible]	[illegible]	[illegible]	8.5				477									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6

TEST NO. 5 & 6

DATE 2-17-79

FUEL A

LOAD 75,000, 45,000

CONDITIONS as found

DATA TAKEN BY JOB

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1,2,5	10:15	7.0	12.0			295	380									3 frozen
																4 out 6 brick
	TEST #6			45000 lbs												
1,2,5,6	1600	10.5	9.4			275	473									
6	16:30	10.5	9.4			281	482									All lines frozen
6	17:00	10.5	9.4			dead										except #6
6	17:30	10.5	9.4			dead										
BLR TEST #5	AVG.	7.0	12.0	▨		▨	380	▨		▨		▨		▨		
~ C TEST #6	AVG.	10.5	9.4	▨		▨	478	▨		▨		▨		▨		
	AVG.			▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6

TEST NO. 7

DATE 2-25-79

FUEL B

LOAD 15,000

CONDITIONS as found

DATA TAKEN BY DB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-5	10:00	14.5	3.7			105	294									
1,2,3,5,6	10:45	14.5	4.6			125	350									
7	11:10	14.6	4.3			130	369									
1,2,3,5,6	11:40	14.5	4.8			140	392	138	386				-6			
7	12:00	14.8	4.4			130	381									
1,2,3,5,6	12:30	14.7	4.4			145	419	145	419				0			
7	12:50	14.9	4.4			135	403									
BLR	AVG.	14.6	4.4	▨		▨	364	▨		▨		▨	-3	▨		
7CK	AVG.	14.8	4.4	▨		▨	384	▨		▨		▨		▨		
	AVG.			▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G
TEST NO 8
DATE 2-25-79

FUEL B
LOAD 75,000
CONDITIONS as found
DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1,2,3,5,6	16:00	5.9	12.2			260	310							170	203	HC is
7	16:35	6.4	11.6			265	327									working
1,2,3,5,6	17:00	6.7	11.7			243	306	243	306	243	306		0	200	252	but doesn't
7	17:25	7.4	11.1			245	324			245	306					zero
1,2,3,5,6	17:50	7.2	10.9			232	303	232	303	232	303		0	170	248	Readings
7	18:15	7.0	11.2			240	309									are not
																correct

AVERAGES

BLR	AVG.	6.6	11.6	▨		▨	306	▨		▨		▨	0	▨	234	
				▨		▨	320	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6

TEST NO. 9

DATE 2-28-79

FUEL A

LOAD Swing

CONDITIONS as found

DATA TAKEN BY JCB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1,2,3,5,6	12:00	8.0	11.2			320	—									No cal off
1,2,3,5,6	12:30	11.3	8			320	—									No cal off
	1-2	[illegible]														
1,2,3,5,6	2:30	9.5	10.0			180	283									
1,2,3,5,6	3:30	12.5	6.4			155	330									
7	4:45	10.0	9.4			220	361									
1,[illegible],3,5,6	5:15	10.0	9.1			230	378									
7	6:00	10.2	9.2			195	326									
BLR	AVG.	10.2	9.0				330									
STACK	AVG.	10.1	9.3				344									
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 10

DATE 3-2-79

FUEL A

LOAD Swing

CONDITIONS as found

DATA TAKEN BY JD

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-6 comp. 4	11:10	8.6	11.1	7		325	415							25	36	
7	11:25	7.6	12.0			308	414							27	36	
1-6 + 4	11:45	12.0	7.8			235	472	240	482				10	28	56	
7	12:25	11.7	8.1			220	428							29	56	RH = 37%
1-6 + 4	12:50	9.5	10.0			283	444	295	463				19	31	48	
7	1:20	8.0	11.6			265	367	250	346				-21	12	17	
1-6	1:35	5.8	10.6			255	377							9	13	

AVERAGES

BLR	AVG	9.7	9.8	▨		▨	442	▨		▨		▨	3	▨	37	
Stack	AVG.	9.1	10.6	▨		▨	403	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 11

DATE 3-3-79

FUEL A

LOAD 60,000

CONDITIONS vary O2

DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-6	8:30	8.0	11.0			290	402	300	416	300	416	0	0	14	19	
7	845	8.9	10.2			305	465							14	21	
1-6	9:00	7.6	11.0			340	458	330	444	330	444	0	0	15	20	
1-6	9:30	6.7	12.2			280	353	265	334	265	334	0	0	18	23	
7	9:55	7.3	11.4			240	316							18	24	
1-6	10:10	6.0	12.8			250	300	240	288	240	288	0	0	20	24	
7	10:30	6.9	11.6			245	313							20	26	

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE C
TEST NO 12
DATE 3-3-79
FUEL A
LOAD 75,000
CONDITIONS Very O_2
DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-6	11:20	7.2	11.6			320	418	280	366	280	366	0	0	30	39	
7	1140	7.4	11.4			300	398							36	48	
1-6	1155	6.8	12.2			300	381	260	330	260	330	0	0	32	41	
7	1210	6.9	12.0			290	371							28	36	HC recal.
7	1230	6.6	12.2			280	350							30	38	
1-6	1240	6.1	12.4			300	363	260	314	260	314	0	0	29	35	
1-6	1300	5.8	12.4			270	320	220	261	220	261	0	0	32	38	
7	1310	6.0	12.4			260	312							38	46	
1-6	1320	5.0	13.2			270	304	220	248	220	248	0	0	35	39	
7	1340	5.8	12.8			250	296							38	45	

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6
TEST NO 15
DATE 3-16-79
FUEL A
LOAD swing
CONDITIONS normal
DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NO_x		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1,3,5,6	11:40	8.0	11.4			340	472									
7	12:14	11.2	8.2			230	424									
1,3,5,6	12:44	8.8	9.8			320	473	275	406	275	406		0			
7	13:10	9.5	9.8			310	487									CO_2 recal
1,3,5,6	13:50	9.0	10.4			300	452									
7	14:20	9.6	9.6			285	447									
1,3,5,6	14:57	8.8	10.8			305	451									
7	15:40	9.5	10.0			300	471									
3,5,6	16:20	9.0	10.4			290	437				0		0			

AVERAGES

BLR	8.7	10.6		▨		▨	457	▨		▨		▨	0	▨		
STACK	9.9	9.4		▨		▨	457	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6

TEST NO 16

DATE 3-17-79

FUEL A

LOAD 15,000

CONDITIONS as found

DATA TAKEN BY R. A.P.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-5	9:45	15.0	4.9	—	—	130	394									P_{BAR} - 30.86
7-STACK	9:50	15.37	4.6	—	—	115	372									
1	10:05	15.1	4.6	—	—	135	416	115	354							NO 20ppm Hi
3	10:18	15.1	4.4	—	—	135	416	115	354							NO 20ppm Hi
4	10:37	15.1	4.8	—	—	120	370									
5	10:43	15.0	4.8	—	—	135	409									
2	10:50	15.2	4.8	—	—	135	424									
1-5	11:40	16.1	4.0	—	—	115	429									
7-STACK	11:55	16.0	4.2	—	—	125	456									NO-DRIFT

AVERAGES

BLR		15.2	4.6				391									
STACK		15.7	4.4				414									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 17

DATE 3-17-79

FUEL A

LOAD 75,000

CONDITIONS without flyash reinjection

DATA TAKEN BY JOB

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
																NO is
7	15:30	8.0	10.8			325	455									drifting
2,3,4,5	15:56	7.3	11.4			300	395									
7	16:24	8.2	11.0			210	296									
2,3,4,5	16:44	7.4	11.6			300	398	90		-10	-13	90				
7	17:05	8.3	10.9			250	353									

AVERAGES

BLR	7.4	11.5					397				-13					
STACK	8.2	10.9					366									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 18

DATE 3/18/77

FUEL D

LOAD 75,000

CONDITIONS as found

DATA TAKEN BY JD

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
7	10:06	8.1	11.2	—	—	270	378									
1-5	10:21	7.6	11.4	—	—	310	417									
7	10:36	7.7	11.4	—		305	416									
1-5	10:51	7.4	11.6	—	—	332	440									
7	11:25	8.0	10.9	—	—	290	402									
1-5	12:00	7.5	11.7	—	—	290	387					5	7			

AVERAGES

B:C	7.5	11.6		▨		▨	415	▨		▨		▨	7	▨	
STACK	7.[illegible]	11.2		▨		▨	345	▨		▨		▨		▨	

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE C
TEST NO 19
DATE 7-18-7[illegible]
FUEL D
LOAD 15 [illegible]
CONDITIONS [illegible]
DATA TAKEN BY B. C.

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
7	2:10	16.2	3.4	—	—	90	343									
1-5	2:20	15.0	4.2			110	334									
7	2:40	15.0	4.0			110	334									
1-5	2:55	15.1	4.0			130	401									
7	3:25	15.0	4.0	—		120	364									
1-5	4:00	15.2	4.6	—	—	130	408	55	172	55	172	0	0			

AVERAGES

BLR		16.1	4.1	▨		▨	381	▨		▨		▨	0	▨		
				▨		▨		▨		▨		▨		▨		
STACK		15.4	3.5	▨		▨	347	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE 6
TEST NO 20
DATE 3-21-79
FUEL [illegible]
LOAD [illegible]
CONDITIONS [illegible] Fuel
DATA TAKEN BY [illegible]

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1,3,4,5	10:25	9.3	10.2	—	—	270	417									
7	11:00	9.5	9.8	—		270	424									2-SASS
1,3,~~4~~,5	11:40	8.5	11.0	—	—	270	376									
7	12:10	10.8	8.8	—	—	230	408									4-SOx
1,3,5	12:40	9.4	10.2	—	—	250	405	68	106	68	106	0	0			
7	13:08	9.9	9.5	—	—	230	358									
1,3,5	13:20	9.5	10.2	—	—	255	400									
7	14:00	8.9	10.7	—	—	260	383									
1,3,5	1425	9.5	10.2	—	—	250	392	63	94	77	121	-14	-22			
1,3,5	1450	8.8	10.7	—	—	250	370									

AVERAGES

BLR		9.2	10.4	▨		▨	346	▨		▨		▨		▨		
				▨		▨		▨		▨		▨	-11	▨		
STACK		9.8	9.1	▨		▨	393	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G
TEST NO 22
DATE 3-23-79
FUEL D
LOAD Swing
CONDITIONS as found
DATA TAKEN BY VA

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		OT LINE SAMPLES, PPM (WET)								REMARKS
								NO_x		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
1-5		8.75	10.6	–	–	260	383									
7		9.0	10.4	–	–	268	433									
1-5		7.8	11.2	–	–	305	420	79	108	89	122		-14			
7		8.4	11.0	–	–	289	397									
1-5		10.7	9.[illegible]			250	438									

AVERAGES

BLR		9.[illegible]	[illegible].3	▨		▨	414	▨		▨		▨	-14	▨		
Stack		9.7	[illegible].7	▨		▨	400	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

4, 8- 42

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G

TEST NO 23

DATE 3/24/79

FUEL O

LOAD 60,000

CONDITIONS High O.E.A.

DATA TAKEN BY J.D.

								HOT LINE SAMPLES, PPM (WET)								
		O2 %	CO2 %	CO ppm(dry)		NO ppm(dry)		NOx		NO		NO2		HC		
Probe Position	Time	(dry)	(dry)	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	REMARKS
1-5	9:10	8.0	11.4	—	--	288	400									
7	9:28	8.75	10.4	—	—	280	401									
1-5	9:46	7.8	11.2	—	—	330	451									
7	10:11	9.25	10.0	—	—	267	410									
1-5	10:30	8.25	11.0	—	—	295	417	64	91	93	132		-41			

AVERAGES

BLR		8.0	11.2				423						-41			
STACK		9.0	10.2				406									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

O/c RH 82   Dry 69° wet 65°

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE G
TEST NO 24
DATE 3-24-79
FUEL 6
LOAD 60,000
CONDITIONS Low OFA
DATA TAKEN BY JD

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	REMARKS
1-5	2:50	6.4	12.0	–	–	260	320									
7	3:07	8.0	11.0	–		250	347									
1-5	3:22	7.2	11.0	–	–	275	359									
1-5	3:40	8.4	11.0	–		230	329	[illegible]	[illegible]	124	150		-57			
7	4:10	5.75	11.0	–	–	260	383									

AVERAGES

BLR		7.3	[illegible]	▨		▨	336	▨		▨		▨	-57	▨		
Stack		5.9	[illegible]	▨		▨	365	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE G
TEST NO 25 - 26
DATE 3-25-79

FUEL D
LOAD 75,000
CONDITIONS Vary O_2
DATA TAKEN BY B.C

	Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
									NOx		NO		NO_2		HC		
					unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
A	1-5	7:40	6.0	12.8	—	—	300	360									Boiler Out
	7	7:55	7.1	12.2	—	-	300	359									Stack
B	1-5	8:05	5.7	13.2	-		330	388									
	7	8:20	7.0	11.6	-		310	399									
C	1-5	8:30	5.2	13.2	—	-	310	353									
	7	8:45	6.2	12.4	--	-	280	341									
D	1-5	9:00	4.0	14.4	—		280	296									
	7	9:15	6.0	13.0	---		260	312									
			Load Changed TEST #26 60,000														
A	1-5	9:40	8.0	11.4	—	-	290	402									
	7	9:55	8.8	11.0	—	-	270	399									
	1-5	10:05	7.0	12.2	—	-	270	348									
B	7	10:20	7.6	11.8	—	—	230	310									
	1-5	10:30	6.0	13.2	—	—	250	300									
C	7	10:45	7.4	11.6	—	-	230	305									
	1-5	10:55	5.2	13.7	—	--	232	265									
D	7	11:10	6.3	12.8	—	-	210	257									

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

SOx DATA SUMMARY - SITE G

Test No.	Load	O2 (%)	SO2 (unc ppm)	SO3 (unc ppm)	SOx (unc ppm)	SO2 (corr ppm)	SO3 (corr ppm)	SOx (corr ppm)	Test Description
9A	72.3	10.0	375.8	3.4	379.2	617	6	623	shell
9B			364.0	2.5	366.5	598	4	602	method #6
9C			396.4	2.9	399.3	651	5	656	shell
15A	87.4	8.7	369	2.3	371.3	541.4	3.4	544.8	shell
15B			390	2.9	392.9	572.2	4.3	576.5	shell
15C			357.2	0.9	358.1	524.0	1.3	525.3	method #6
15D			367.9	1.3	369.2	539.8	1.9	541.7	method #6
20A	77.7	9.2	340.2	1.3	341.5	520.5	2.0	522.5	Method #6
20B			382.8	1.7	384.5	585.7	2.6	588.3	method #6
20C			336	5.9	341.9	514.1	9.0	523.1	shell
20D			339	4.7	343.7	518.6	7.2	525.8	shell

8830-7

Local Site 6

SOx DATA SHEET

Test # 1 + 2 Test 3

Date 2-8-79 Probe Location & Probe Length Port # 2 13" ΔP=.07 24" ΔP=.07

Unit # 5 Fuel A Load swing ~ 54 Klbs

Test Description: Swing Load – Test 1+2 about 60K Test 3 Load 40K

Test No. #9	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
1	2 - flask # 1B	0.0 13:59.5	128 130	0 ↓	0.0 1.00	30.5	2	 60	 10.0
method 6 → 2	1 BB	0.0 15.183	130 130	↓ ↓	0.0 1.00	↓ ↓	↓	 60	
3	1 1C	0.0 13.37.0	130 130	↓ ↓	0.0 1.00	↓	↓	 45	

SAMPLED BY

N = H_2SO_4 = .0214

Test # 1 (1B) Test # 2 method 6 Test # 3 (1C)

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.00977			.00968			.00977		
Dilution Factor F	10	1		5	1		10	1	
Blank B	0			0			0		
Averages									
Ml. of Titrant A	8.3 8.3 8.3	.75		16.1 16.3 16.2	.55		8.7 8.8 8.7	.65	
Averages									
460 + T	587			590			590		
Sample Vol. V	1			1			1		
P + p									
A - B	8.3	.75		16.2	.55		8.74	.65	

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(8.3)(.00977)(10)(587)\,24}{(1)(30.5)}$$

SO2 = $\boxed{375.8}$ SO3 = $\boxed{3.4}$

$$SO3 = \frac{(.75)(.00977)(1)(587)\,24}{(1)(30.5)}$$

SO2 @ 3% O2 = 617
SO3 @ 3% O2 = 6
SOx @ 3% O2 = 623

$$SO2 = \frac{(16.2)(.00968)(5)(590)\,24}{(\quad)(30.5)}$$

SO2 = $\boxed{364.0}$

$$SO3 = \frac{(\quad)(\quad)(\quad)(\quad)\,24}{(\quad)(\quad)}$$

SO3 = $\boxed{2.5}$

SO2 @ 3% O2 = 598
SO3 @ 3% O2 = 4
SOx @ 3% O2 = 602

$$SO2 = \frac{(8.74)(.00977)(10)(590)\,24}{(\quad)(\quad)}$$

SO2 = $\boxed{396.4}$

$$SO3 = \frac{(\quad)(\quad)(\quad)(\quad)\,24}{(\quad)(\quad)}$$

SO3 = $\boxed{2.9}$

SO2 @ 3% O2 = 651
SO3 @ 3% O2 = 5
SOx @ 3% O2 = 656

SHELL METHOD

Local Site G

SOx DATA SHEET

Date 3-16-79 Probe Location & Probe Length BLR OUT PORT # 2 - Site G

Unit # ______ Fuel ______ Load ______

Test Description: ______

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
15A	1	14:31	108	—0—	0.000	30.73	2	15:05	
		14:51	114		1.5000			15:35	
15B	2	14:59	115		0.000			15:35	
		15:18	118		1.500			16:05	

SAMPLED BY

Test # 15A Test # 15B Test #

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0097	→			→				
Dilution Factor F	20	1		20	1				
Blank B									
Averages									
Ml. of Titrant A	6.3 6.3 6.5	.8		6.7 6.6 6.7	1.0				
Averages	6.4			6.7	1.0				
460 + T	571			576.5					
Sample Vol. V	1.500			1.500					
P + p	30.73			30.73					
A - B	6.4	.8		6.7	1.0				

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(6.4)(.0097)(20)(571)24}{(1.500)(30.73)}$$

SO2 = 369. SO3 = 2.3

$$SO3 = \frac{(.8)(.0097)(1)(571)24}{(1.5)(30.73)}$$

SO2 @ 3% O2 = 541.4

SO3 @ 3% O2 = 3.4

SOx @ 3% O2 = 544.8

$$SO2 = \frac{(6.7)(.0097)(20)(576.5)24}{(1.500)(30.73)}$$

SO2 = 390

$$SO3 = \frac{(1)(.0097)(1)(576.5)24}{(1.5)(30.73)}$$

SO3 = 2.9

SO2 @ 3% O2 = 572.2

SO3 @ 3% O2 = 4.3

SOx @ 3% O2 = 576.5

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 =

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 =

SO2 @ 3% O2 = ______

SO3 @ 3% O2 = ______

SOx @ 3% O2 = ______

METHOD #6

Local Site G

SOx DATA SHEET

Date 3-16-79 Probe Location & Probe Length BLR OUT -

Unit # ____ Fuel ____ Load ____

Test Description: ____

Test No.	Box No.	Sample Time	Meter Temp.(T)	(P) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
15C	#6-1	16:05	120	-0-	0.000	30.73	2	16:16	
		16:15	120		1.000			16:31	
15D	#6-2	16:35	120		0.000			—	
		16:45	120		1.000			—	

SAMPLED BY ____

Test # 6-1 Test # 6-2 Test # ____

	6-1 SO2	6-1 SO3	6-1 SOx	6-2 SO2	6-2 SO3	6-2 SOx	SO2	SO3	SOx
Normality N	.0095	→							
Dilution Factor F	5	1		5	1				
Blank B	~~[illegible]~~								
Averages									
Ml. of Titrant A	16.5 16.6 16.7	.2		17.1 17.2 16.9	.3				
Averages	16.6	.2		17.1	.3				
460 + T	580			580					
Sample Vol. V	1.000			1.000					
P + p	30.73			30.73					
A - B	16.6			17.1	.3				

15C $C_{SO_2} = 5.924 \times 10^{-5}$ lb/ft^3 - SO_2

15D - $C_{SO_2} = 6.103 \times 10^{-5}$ lb/ft^3 - SO_2

$SO_2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$

$SO_2 = \frac{(16.6)(.0095)(5)(580)\,24}{(1)(30.73)}$

$SO_2 = \boxed{357.2}$ $SO_3 = \boxed{.9}$

$SO_3 = \frac{(.2)(.0095)(1)(580)\,24}{(1)(30.73)}$

SO_2 @ 3% O_2 = 524.0

SO_3 @ 3% O_2 = 1.3

SOx @ 3% O_2 = 525.3

$SO_2 = \frac{(17.1)(5)(.0095)(580)\,24}{(1)(30.73)}$

$SO_2 = \boxed{367.9}$

$SO_3 = \frac{(.3)(.0095)(1)(580)\,24}{(1)(30.73)}$

$SO_3 = \boxed{1.3}$

SO_2 @ 3% O_2 = 534.8

SO_3 @ 3% O_2 = 1.9

SOx @ 3% O_2 = 54.7

$SO_2 = \frac{(\ )(\ )(\ )(\ )\,24}{(\ )(\ )}$

$SO_2 = \boxed{\ }$

$SO_3 = \frac{(\ )(\ )(\ )(\ )\,24}{(\ )(\ )}$

$SO_3 = \boxed{\ }$

SO_2 @ 3% O_2 = ____

SO_3 @ 3% O_2 = ____

SOx @ 3% O_2 = ____

(over)

Local TEST SITE G

SOx DATA SHEET

Date 3-21-79 Probe Location & Probe Length 3'

Unit # 5 Fuel COAL D Load Swing

Test Description: METHOD #6

Test No.	Box No.	Sample Time	Meter Temp.(T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
20A	6-A	11:45	106	0	0.000	30.40	2	11:57	
		11:55	108		1.000			12:12	
20B	6-B	12:25	113		0.000	30.4	2	12:37	
		12:35	114		1.000			12:52	

STACK GAS ΔP = -0.10 sample @ 0.1 cfm

	Test # 20A			Test # 20B			Test #		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	0.0095	→							
Dilution Factor F	5	1		5	1				
Blank B									
Averages									
Ml. of Titrant A	16.0	0.3		17.8	0.4				
	16.0			17.8					
	16.2			17.8					
Averages	16.1			17.8					
460 + T	567			573.5					
Sample Vol. V	1.000			1.000					
P + p	30.40			30.40					
A - B	16.1	0.3		17.8	.4				

$C_{SO_2} = 5.643 \times 10^{-5}$ lb/ft^3

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(16.1)(.0095)(5)(567)\,24}{(1)(30.4)}$$

SO2 = $\boxed{340.2}$ SO3 = $\boxed{1.3}$

$$SO3 = \frac{(.3)(.0095)(1)(567)\,24}{(1.0)(30.4)}$$

SO2 @ 3% O2 = 520.5

SO3 @ 3% O2 = 2.0

SOx @ 3% O2 = 522.5

$C_{x_2} = 5.772 \times 10^{-5}$ lb/ft^3

$$SO2 = \frac{(17.8)(.0095)(1.0)(573.5)\,24}{(1.0)(30.4)}$$

SO2 = $\boxed{382.8}$

$$SO3 = \frac{(.4)(.0095)(1.0)(573.5)\,24}{(1.0)(30.4)}$$

SO3 = $\boxed{1.7}$

SO2 @ 3% O2 = 585.7

SO3 @ 3% O2 = 2.6

SOx @ 3% O2 = 588.3

$$SO2 = \frac{(\ \ )(\ \ )(\ \ )(\ \ )\,24}{(\ \ )(\ \ )}$$

SO2 = $\boxed{\ \ }$

$$SO3 = \frac{(\ \ )(\ \ )(\ \ )(\ \ )\,24}{(\ \ )(\ \ )}$$

SO3 = $\boxed{\ \ }$

SO2 @ 3% O2 =

SO3 @ 3% O2 =

SOx @ 3% O2 =

SAMPLED BY

TITRATED BY

SHELL METHOD

Local site 6

SOx DATA SHEET

Date 3-21-79 Probe Location & Probe Length 3'

Unit # ______ Fuel ______ Load ______

Test Description: ______

Test No.	Box No.	Sample Time	Meter Temp.(T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
20C	2	13:07	118	-0-	0.000	30.40	PORT # 2		
		—	119		1.500				
20D	1	13:39	119		0.000				
		14:03	119		1.700				

SAMPLED BY ______

Test # 20C Test # 20D Test # ______

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0097	→							
Dilution Factor F	20	1		20	1				
Blank B									
Averages									
Ml. of Titrant A	5.9 5.9 5.4	2.0		6.5 6.5 6.6	1.8				
Averages	5.7			6.5	1.8				
460 + T	578			579					
Sample Vol. V	1.500			1.700					
P + p	30.40			30.40					
A - B	5.7			6.5	1.8				

$$SO2 = \frac{(A-B)(N)(F)(460-T)(24)}{V(P+p)}$$

$$SO2 = \frac{(5.7)(.0097)(20)(578)\,24}{(1.500)(30.40)}$$

SO2 = 336 SO3 = 5.9

$$SO3 = \frac{(2)(.0097)(1)(578)\,24}{(1.5)(30.40)}$$

SO2 @ 3% O2 = 514.1
SO3 @ 3% O2 = 9.0
SOx @ 3% O2 = 523.1

$$SO2 = \frac{(6.5)(.0097)(20)(579)\,24}{(30.40)(1.700)}$$

SO2 = 339

$$SO3 = \frac{(1.8)(.0097)(1)(579)\,24}{(30.4)(1.7)}$$

SO3 = 4.7

SO2 @ 3% O2 = 518.6
SO3 @ 3% O2 = 7.2
SOx @ 3% O2 = 525.8

SO2 = ( )( )( )( ) 24 / ( )( )

SO2 =

SO3 = ( )( )( )( ) 24 / ( )( )

SO3 =

SO2 @ 3% O2 = ______
SO3 @ 3% O2 = ______
SOx @ 3% O2 = ______

SECTION 4.0

PARTICULATE SIZE DISTRIBUTION

PAGE

4.1 BRINK 150

4.2 SASS 156

4.3 BAHCO 157

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 5
LOAD 75,000
TEST SITE ABMA G
% O_2 7%
TEST DATE 2-17-79
FUEL K
SAMPLE LOCATION BLR OUT
SPECIAL CONDITIONS REINJECTION

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.28
GAS TEMP. °R, Ts 960
PITOT CORRECTION FACTOR, Cp 0.837
BAROMETRIC PRESS in. Hg, P_{bar} 30.95
GAS STATIC PRESS in. H_2O -1.0
GAS STATIC PRESS in. Hg abs., Ps 30.88
MOLECULAR WT. FLUE GAS, MW_s 29.4

$$V_s = 85.48\ C_p \left(\frac{T_s\ \Delta P}{P_s\ MW_s}\right)^{1/2} = 38.93 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn 0.08
NOZZLE AREA ft^2, An 3.491×10^{-5} $An = \pi(Dn/24)^2$

$Q_n = V_s\ A_n\ 60 = 0.0815$ ft^3/min at nozzle

$Q_c = Q_s \left(\frac{P_s MW_s}{1.3 T_s}\right)^{1/2} = 0.0695$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 23.5 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 24.5 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	0	0.00	86
FINAL	23.7	1.00	86
Δ	23.7	1.00	86

$\%H_2O = 6.0\ \%$

$$I = \frac{1.667\ T_s\ V_m\ P_{bar}}{\theta\ T_m\ V_s\ P_s\ A_n\left(1 - \frac{\%H_2O}{100}\right)} = 97\ \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 5

LOCATION Port #5 18" inches in port

TEST DATE 2-17-79

ENGINEER Mike Jackson

TEST DESCRIPTION Brink at Boiler Out

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		Beaker #9						
TARE WT.	1	64.5866	3.5113	3.0934	3.4985	3.4647	3.9021	0.0350
	2	64.5867	3.5107	3.0929	~~[illegible]~~	3.4642	3.9020	0.0351
	3	64.5865	3.5108	3.0930	3.4979	3.4640	3.9018	0.0350
	4				3.4979			
AVERAGE		64.5866	3.5109	3.0931	3.4981	3.4643	3.9020	0.0350

POST TEST WEIGHTS (GRAMS)

DATE WT.		Beaker #9						
GROSS WT.	1	64.7131	3.5179	3.0959	3.4996	3.4654	3.9030	0.0404
	2	64.7129	3.5172	3.0955	3.4996	3.4648	3.9028	0.0394
	3	64.7131	3.5174	3.0954	3.5000	3.4650	3.9024	0.0399
	4							
AVERAGE		64.7130	3.5175	3.0956	3.4997	3.4651	3.9027	0.0399

NET TEST RESULTS (MILLIGRAMS)

NET WT.	0.1264	0.0066	0.0025	0.0016	0.0008	0.0007	0.0049
PERCENT	88.1	4.6	1.7	1.1	0.6	0.5	3.4

TOTAL NET WEIGHT 143.5 mgm

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 5
TEST SITE ABMA G
TEST DATE 2/17/79
SAMPLE LOCATION Blr Out

LOAD 75,000
% O_2 7
FUEL A
SPECIAL CONDITIONS Reinjection

ρp - Density of particles 2.5 g/cm^3
μ - Viscosity of flue gas 2.75 $\times 10^{-4}$ poise
MWs - Molecular wt. flue gas 29.4 g/g mole
ΔP_I - Pressure drop across impactor 23.5 in H_2O
Ps - Absolute stack pressure 30.88 in. Hg
Ts - Absolute stack temperature 960 °R
Qs - Actual flow rate at stack conditions .07 ft^3/min

Vm - Dry gas volume 1.00 SCF
Mn - Total particulate mass 143.5 mgm
Cn - Total concentration 2.216 $\frac{\text{grains}}{\text{SCF}}$
I - Percent isokinetics 97 %
Vs - Gas velocity 38.93 ft/sec.
Dn - Nozzle diameter 0.08 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		.2490	0.1775	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		.0210	0.0273	0.0395	0.0903	0.3277	
$D_{S,50}$ Stokes diameter, µm		3.04	1.75	1.16	0.56	0.32	
$D_{A,50}$ Aerodynamic diameter, µm		4.92	2.88	1.95	1.00	0.61	
$D_{AI,50}$ Aerodynamic impaction diameter, µm		5.13	3.09	2.15	1.20	0.81	
Mn - Particulate mass, mgm	126.4	6.6	2.5	1.6	0.8	0.7	4.9
% - Percent of Total	88.1	4.6	1.7	1.1	0.6	0.5	3.4
Cumulative percent	11.9	7.3	5.6	4.5	3.9	3.4	
Cn - Concentration, grains/SCF	1.95	0.10	0.04	0.02	0.01	0.01	0.08
Cumulative concentration, grains/SCF	1.95	2.05	2.09	2.11	2.12	2.13	2.21

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 17
LOAD 75,000
TEST SITE G
% O_2
TEST DATE 3-17-79
FUEL A
SAMPLE LOCATION BLR OUT PORT #2
SPECIAL CONDITIONS W.O. Reinjection

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP .26
BAROMETRIC PRESS in. Hg, P_{bar} 30.80
GAS TEMP. °R, Ts 1015
GAS STATIC PRESS in. H_2O -1.0 H_2O
PITOT CORRECTION FACTOR, Cp .857
GAS STATIC PRESS in. Hg abs., Ps 30.73
MOLECULAR WT. FLUE GAS, MW_s 29.0

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{1/2} = 38.93\ \text{ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .076
NOZZLE AREA ft^2, An 3.1503×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = .073$ ft^3/min at nozzle

$Qc = Qs\ \left(\frac{PsMWs}{1.3Ts}\right)^{1/2} = .060$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 17.2 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 18.2 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	0	0.000	110
FINAL	34' 45"	1.500	110
Δ	34.75	1.300	110

$\%H_2O = 5.0\ \%$

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An(1-\frac{\%H_2O}{100})} = 95.5\ \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 17

LOCATION Port #2 Boiler Outlet

TEST DATE 3-17-79

ENGINEER Ross

TEST DESCRIPTION Brink port #2 15 inches without flyash reinjection

---

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.								
TARE WT.	1	0.1597	3.5112	3.0937	3.4474	3.4644	3.9020	0.0352
	2	0.1597	3.5108	3.0932	3.4472	3.4641	3.9016	0.0349
	3	0.1597	3.5106	3.0930	3.4473	3.4641	3.9016	0.0351
	4							
AVERAGE		0.1597	3.5109	3.0933	3.4473	3.4642	3.9017	0.351

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	0.3171	3.5243	3.0974	3.4496	3.4656	3.9028	0.0353
	2	0.3173	3.5239	3.0972	3.4494	3.4656	3.9026	0.0351
	3	0.3169	3.5241	3.0972	3.4495	3.4657	3.9026	0.0353
	4							
AVERAGE		0.3171	3.5241	3.0972	3.4496	3.4656	3.9027	0.0352

NET TEST RESULTS (MILLIGRAMS)

NET WT.	0.1574	0.0132	0.0040	0.0022	0.0014	0.0010	0.0001
PERCENT	87.8	7.4	2.2	1.2	0.78	0.56	0.06

TOTAL NET WEIGHT 179.3 mgm

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 17
TEST SITE ABMAG
TEST DATE 3/17/79
SAMPLE LOCATION Blr. Out Port 2
LOAD 75,000
% O_2 7 %
FUEL A
SPECIAL CONDITIONS W. O. Reinj.

ρp - Density of particles 2.5 g/cm^3
μ - Viscosity of flue gas 2.75 $\times 10^{-4}$ poise
MWs - Molecular wt. flue gas 29.0 g/g mole
ΔP_I - Pressure drop across impactor 17.2 in H_2O
Ps - Absolute stack pressure 30.73 in. Hg
Ts - Absolute stack temperature 1015 °R
Qs - Actual flow rate at stack conditions .06 ft^3/min
Vm - Dry gas volume 1.3 SCF
Mn - Total particulate mass 179.3 mgm
Cn - Total concentration 2.130 grains/SCF
I - Percent isokinetics 95.5 %
Vs - Gas velocity 38.93 ft/sec.
Dn - Nozzle diameter 0.076 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
Ds$_{50}$ Stokes diameter, µm		3.29	1.89	1.26	0.61	0.35	
D$_{A,50}$ Aerodynamic diameter, µm		5.32	3.12	2.11	1.08	0.66	
D$_{AI,50}$ Aerodynamic impaction diameter, µm		5.54	3.33	2.33	1.30	0.88	
Mn - Particulate mass, mgm	157.4	13.2	4.0	2.2	1.4	1.0	0.1
% - Percent of Total	87.8	7.4	2.2	1.2	0.78	0.56	0.06
Cumulative percent	12.2	4.8	2.6	1.4	0.62	0.06	
Cn - Concentration, grains/SCF	14.07	0.16	0.05	0.03	0.03	0.01	0.00
Cumulative concentration, grains/SCF	14.07	14.23	14.28	14.31	14.34	14.35	14.35

SITE G

SASS GRAVIMETRICS

Test 9	10μ	13.1823	21.06% Passing
	3μ	1.7872	10.36% Passing
	1μ	0.5809	6.88% Passing
	Filter	1.1490	
	Total	16.6994	
Test 15	10μ	22.9985	27.52% Passing
	3μ	6.1673	8.10% Passing
	1μ	1.6766	2.80% Passing
	Filter	0.8931	
	Total	31.7355	
Test 20	10μ	56.4322	50.19% Passing
	3μ	30.8089	23.00% Passing
	1μ	25.1032	0.85% Passing
	Filter	0.9585	
	Total	113.3028	

KVB
6990-01
July 12, 1979

Sample No.	K-23144	K-23145	K-23146
Description	Fly Ash G-5 2/17/79	Fly Ash G-8 2/25/79	Fly Ash G-17 3/17/79

Bahco Particle
Size Determination

	K-23144	K-23145	K-23146
% Through #100 (149 Microns)	26.1	33.3	40.3

Results: Terminal Velocity	Diameter (Microns)	%Smaller	Diameter (Microns)	% Smaller	Diameter (Microns)	%Smaller
112.	29.	12.7	26.	18.5	27.	24.0
79.	24.	10.9	22.	16.2	22.	21.4
31.	15.	7.1	14.	10.4	14.	14.5
12.3	9.5	4.2	8.6	6.4	8.8	8.7
4.15	5.5	2.3	5.0	4.0	5.1	4.8
0.96	2.6	0.9	2.4	2.0	2.5	1.9
0.35	1.6	0.3	1.4	0.9	1.5	0.7

	K-23144	K-23145	K-23146
Density, gms/cc (On #100 Mesh Material Only)	1.91	2.32	2.18

Screen Sizing

	K-23144	K-23145	K-23146
% Through #10	100.0	100.0	100.0
16	96.6	95.8	97.5
30	64.8	64.6	76.2
50	39.8	45.2	54.8
100	26.1	33.3	40.3
200	14.9	21.8	25.9
325	9.9	15.1	18.8

KVB
6990-01
July 12, 1979

Sample No.	K-23147	K-23143
Sample Description	Fly Ash G-18 3/18/79	Fly Ash G-4 2/16/79

Bahco Particle
Size Determination

	K-23147	K-23143
% Through #100 (149 Microns)	32.6	37.2

Results: Terminal Velocity	Diameter (Microns)	%Smaller	Diameter (Microns)	%Smaller
112.	26.	20.5	26.	21.3
79.	22.	18.2	22.	19.0
31.	14.	12.5	14.	13.1
12.3	8.8	7.5	8.7	8.0
4.15	5.1	4.0	5.0	4.7
0.96	2.4	1.7	2.4	2.0
0.35	1.4	0.5	1.5	0.8

	K-23147	K-23143
Density, gms/cc (On #100 Mesh Material Only)	2.47	2.27

Screen Sizing

	K-23147	K-23143
% Through #10	100.0	100.0
16	97.0	98.0
30	73.3	76.7
50	49.1	53.3
100	32.6	37.2
200	20.0	22.8
325	13.6	15.8

SECTION 5.0

FUEL AND ASH ANALYSIS

PAGE

5.1 COMMERCIAL TESTING ANALYSIS 160

5.2 COMBUSTIBLES ANALYSIS 221

5.3 COAL SIEVE ANALYSIS 224

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Test No.: 2
Test Site: G

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/11/79
Date received	5/3/79

Analysis report no. 71- 31076

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.55	xxxxx
% Ash	9.44	9.89
% Volatile	35.68	37.38
% Fixed Carbon	50.33	52.73
	100.00	100.00
Btu/lb.	12639	13242
% Sulfur	0.72	0.75

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H Cone Height
W Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

Charter Member

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Coal

Test No.: 3
Test Site: G

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 2/11/79

Date received: 5/3/79

Analysis report no. 71- 31075

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.40	xxxxx
% Ash	5.91	6.18
% Volatile	35.79	37.44
% Fixed Carbon	53.90	56.38
	100.00	100.00
Btu/lb.	13224	13833
% Sulfur	0.81	0.85

FUSION TEMPERATURE OF ASH

	Reducing		Oxidizing	
Initial Deformation	xxxx	F	xxxx	F
Softening (H = W)	xxxx	F	xxxx	F
Softening (H = ½W)	xxxx	F	xxxx	F
	xxxx	F	xxxx	F

H = Cone Height
W = Cone Width

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Test No.: 4
Test Site: G

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/16/79
Date received	5/3/79

Analysis report no. 71- 31077

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.57	xxxxx
% Ash	7.65	8.10
% Volatile	34.66	36.70
% Fixed Carbon	52.12	55.20
	100.00	100.00
Btu/lb.	12864	13623
% Sulfur	0.60	0.64

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H=W)	xxxx °F	xxxx °F
Softening (H=½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H = Cone Height
W = Cone Width

Respectfully submitted,
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R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No.: 5
Test Site: G

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/17/79
Date received	5/3/79

Analysis report no. 71- 31074

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	7.56	xxxxx
% Ash	10.05	10.87
% Volatile	31.80	34.40
% Fixed Carbon	50.59	54.73
	100.00	100.00
Btu/lb.	12036	13020
% Sulfur	0.85	0.92

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H — Cone Height
W — Cone Width

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No.: 6
Test Site: G

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/17/79
Date received	5/3/79

Analysis report no. 71- 31000

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	3.16	xxxxx
% Ash	7.05	7.28
% Volatile	37.23	38.44
% Fixed Carbon	52.56	54.28
	100.00	100.00
Btu/lb.	13254	13687
% Sulfur	0.86	0.89

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX °F	XXXX °F
Softening (H = W)	XXXX °F	XXXX °F
Softening (H = ½W)	XXXX °F	XXXX °F
Fluid	XXXX °F	XXXX °F

H = Cone Height
W = Cone Width

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Test No.: 7
Test Site: G

Analysis report no. 71- 31080

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	3.12	xxxxx
% Ash	4.57	4.72
% Volatile	39.33	40.60
% Fixed Carbon	52.98	54.68
	100.00	100.00
Btu/lb	13797	14241
% Sulfur	1.16	1.20

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H=W)	xxxx °F	xxxx °F
Softening (H=½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Test No.: 8
Test Site: G

Analysis report no. 71- 31078

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	2.91	xxxxx
% Ash	4.27	4.40
% Volatile	38.62	39.78
% Fixed Carbon	54.20	55.82
	100.00	100.00
Btu/lb.	13922	14339
% Sulfur	1.46	1.50

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H — Cone Height
W — Cone Width

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test Site G
Sample taken by	KVB, Inc.
Date sampled	2/28/79
Date received	5/3/79

Test No. 9
Sample: A
Test Site: G
Date taken 2/28/79

Analysis report no. 71- 30996 page 1 of 2

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.32	xxxxx
% Ash	7.24	7.57
% Volatile	36.72	38.38
% Fixed Carbon	51.72	54.05
	100.00	100.00
Btu/lb.	13117	13709
% Sulfur	0.81	0.85

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.32	xxxxx
% Carbon	73.76	77.09
% Hydrogen	4.90	5.12
% Nitrogen	0.84	0.88
% Chlorine	0.12	0.13
% Sulfur	0.81	0.85
% Ash	7.24	7.57
% Oxygen(diff)	8.01	8.36
	100.00	100.00

FUSION TEMPERATURE OF ASH	Reducing
Initial Def.,IT ----	2700+°F
Softening, ST ------	2700+°F
Softening, HT ------	2700+°F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR		
% Pyritic	0.12	0.13
% Sulfate	0.03	0.03
% Organic	0.66	0.69

HARDGROVE GRINDABILITY INDEX: 41

FREE SWELLING INDEX: 2-1/2

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test site G
Sample taken by	KVB, Inc.
Date sampled	2/28/79
Date received	5/3/79

Test No. 9
Sample: A
Test site: G
Date taken: 2/28/79

Analysis report no. 71- 30996 page 2 of 2

MINERAL ANALYSIS OF ASH	Percent Weight Ignited Basis
Silica, SiO_2	51.40
Alumina, Al_2O_3	32.80
Titania, TiO_2	1.39
Ferric oxide, Fe_2O_3	6.99
Lime, CaO	2.11
Magnesia, MgO	1.02
Potassium oxide, K_2O	2.23
Sodium oxide, Na_2O	0.52
Sulfur trioxide, SO_3	0.99
Phos. pentoxide, P_2O_5	0.18
Strontium Oxide, SrO	0.05
Barium Oxide, BaO	0.24
Manganese Oxide, Mn_3O_4	0.01
Undetermined	0.07
	100.00

Alkalies as Na_2O, Dry Coal Basis = 0.15
Silica Value = 83.55
Base: Acid Ratio = 0.15
ESTIMATED VISCOSITY at critical viscosity
Temperature of ---- F = ---- Poises
T Temperature = 2820 °F

Fouling Index = 0.08
Slagging Index = 0.13

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

Charter Member

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Test No.: 10
Test Site: G
Sample: A

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/2/79
Date received	5/3/79

Analysis report no. 71- 31072

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	3.90	xxxxx
% Ash	8.57	8.92
% Volatile	34.89	36.31
% Fixed Carbon	52.64	54.77
	100.00	100.00
Btu/lb	12837	13358
% Sulfur	0.93	0.97

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H=W)	xxxx °F	xxxx °F
Softening (H=½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test Site G
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Test No. 15
Sample: A
Test Site: G
Date taken 3/17/79

Analysis report no. 71- 30992 page 1 of 2

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.22	xxxxx
% Ash	9.50	9.92
% Volatile	34.95	36.49
% Fixed Carbon	51.33	53.59
	100.00	100.00
Btu/lb.	12649	13206
% Sulfur	0.68	0.71

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.22	xxxxx
% Carbon	71.62	74.78
% Hydrogen	4.66	4.87
% Nitrogen	1.12	1.17
% Chlorine	0.07	0.07
% Sulfur	0.68	0.71
% Ash	9.50	9.92
% Oxygen(diff)	8.13	8.48
	100.00	100.00

FUSION TEMPERATURE OF ASH

	Reducing
Initial Def.,IT ----	2700+°F
Softening, ST ------	2700+°F
Softening, HT ------	2700+°F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR

% Pyritic	0.05	0.06
% Sulfate	0.04	0.04
% Organic	0.59	0.61

HARDGROVE GRINDABILITY INDEX: 41

FREE SWELLING INDEX: 2

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification
by KVB, Inc.

Test No. 15
Sample: A
Test site: G
Date taken: 3/17/79

Kind of sample reported to us	Coal
Sample taken at	Test site G
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Analysis report no. 71- 30992 page 2 of 2

MINERAL ANALYSIS OF ASH	Percent Weight Ignited Basis
Silica, SiO_2	52.83
Alumina, Al_2O_3	31.52
Titania, TiO_2	1.58
Ferric oxide, Fe_2O_3	6.84
Lime, CaO	1.19
Magnesia, MgO	1.09
Potassium oxide, K_2O	2.47
Sodium oxide, Na_2O	0.48
Sulfur trioxide, SO_3	0.80
Phos. pentoxide, P_2O_5	0.14
Strontium Oxide, SrO	0.08
Barium Oxide, BaO	0.23
Manganese Oxide, Mn_3O_4	0.02
Undetermined	0.73
	100.00

Alkalies as Na_2O, Dry Coal Basis	0.21		
Silica Value	85.28	Fouling Index =	0.07
Base: Acid Ratio	0.14	Slagging Index =	0.10

ESTIMATED VISCOSITY at critical temperature
Temperature of ---- °F = ---- Poise
T250 Temperature 2845 °F

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No.: 16
Test Site: G
Sample: A

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Analysis report no. 71- 31071

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.02	xxxxx
% Ash	7.63	7.95
% Volatile	34.86	36.32
% Fixed Carbon	53.49	55.73
	100.00	100.00
Btu/lb.	12965	13508
% Sulfur	0.74	0.77

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No.: 17
Test Site: G
Sample: A

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Analysis report no. 71- 31073

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	3.88	xxxxx
% Ash	7.41	7.71
% Volatile	35.33	36.76
% Fixed Carbon	53.38	55.53
	100.00	100.00
Btu/lb.	13103	13632
% Sulfur	0.82	0.85

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½ W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No. 18
Test Site: G
Sample: D

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/18/79
Date received	5/3/79

Analysis report no. 71- 31079

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	5.04	xxxxx
% Ash	8.94	9.41
% Volatile	34.03	35.84
% Fixed Carbon	51.99	54.75
	100.00	100.00
Btu/lb.	12488	13151
% Sulfur	0.69	0.73

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX °F	XXXX °F
Softening (H = W)	XXXX °F	XXXX °F
Softening (H = ½W)	XXXX °F	XXXX °F
Fluid	XXXX °F	XXXX °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/18/79
Date received	5/3/79

Test No.: 19
Test Site: G
Sample: D

Analysis report no. 71- 30998

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.53	xxxxx
% Ash	6.52	6.83
% Volatile	36.91	38.66
% Fixed Carbon	52.04	54.51
	100.00	100.00
Btu/lb.	12989	13605
% Sulfur	0.85	0.89

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½ W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H Cone Height
W Cone Width

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test Site G
Sample taken by	KVB, Inc.
Date sampled	3/21/79
Date received	5/3/79

Test No. 20
Sample: D
Test Site: G
Date taken 3/21/79

Analysis report no. 71- 30997 page 1 of 2

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.81	xxxxx
% Ash	6.95	7.30
% Volatile	36.47	38.31
% Fixed Carbon	51.77	54.39
	100.00	100.00
Btu/lb.	12860	13510
% Sulfur	0.69	0.72

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.81	xxxxx
% Carbon	72.43	76.09
% Hydrogen	4.90	5.15
% Nitrogen	1.04	1.09
% Chlorine	0.05	0.05
% Sulfur	0.69	0.72
% Ash	6.95	7.30
% Oxygen(diff)	9.13	9.60
	100.00	100.00

FUSION TEMPERATURE OF ASH	Reducing
Initial Def., IT ----	2700+°F
Softening, ST ------	2700+°F
Softening, HT ------	2700+°F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR		
% Pyritic	0.10	0.10
% Sulfate	0.00	0.00
% Organic	0.59	0.62

HARDGROVE GRINDABILITY INDEX: 35

FREE SWELLING INDEX: 2-1/2

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of [illegible] Coal

Test No. 20
Sample: D
Test site: G
Date taken: 3/21/79

Sample taken at Test site G

Sample taken by KVB, Inc.

Date sampled 3/21/79

Date received 5/3/79

[illegible] 71- 30997 page 2 of 2

[illegible]

49.62
37.75
1.88

4.52
1.32
0.84
1.53
0.31

0.56
0.15
0.07
0.12
0.01
1.32
100.00

0.10
88.13 [illegible] 0.03
0.10 [illegible] 0.07

---- ----
2900+

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KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Test No.: 22
Test Site: G
Sample: D

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/23/79
Date received	5/3/79

Analysis report no. 71- 30999

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.69	xxxxx
% Ash	7.17	7.52
% Volatile	37.65	39.50
% Fixed Carbon	50.49	52.98
	100.00	100.00
Btu/lb.	12881	13515
% Sulfur	0.78	0.82

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H = Cone Height
W = Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/24/79
Date received	5/3/79

Test No.: 23
Test Site: G
Sample: D

Analysis report no. 71- 31070

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	4.56	xxxxx
% Ash	7.15	7.49
% Volatile	36.83	38.59
% Fixed Carbon	51.46	53.92
	100.00	100.00
Btu/lb.	12830	13443
% Sulfur	0.83	0.87

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	XXXX °F	XXXX °F
Softening (H = W)	XXXX °F	XXXX °F
Softening (H = ½W)	XXXX °F	XXXX °F
Fluid	XXXX °F	XXXX °F

H Cone Height
W Cone Width

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Co.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 16, 1979

Sample identification
by KVB, Inc.

Test No.: 24
Test Site: G
Sample: D

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/24/79
Date received	5/3/79

Analysis report no. 71- 31081

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	3.93	xxxxx
% Ash	7.19	7.48
% Volatile	35.87	37.34
% Fixed Carbon	53.01	55.18
	100.00	100.00
Btu/lb.	12943	13472
% Sulfur	0.69	0.72

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxx °F	xxxx °F
Softening (H = W)	xxxx °F	xxxx °F
Softening (H = ½W)	xxxx °F	xxxx °F
Fluid	xxxx °F	xxxx °F

H – Cone Height
W – Cone Width

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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test Site G
Sample taken by	KVB, Inc.
Date sampled	-----
Date received	5/3/79

Test No. Composite
Sample: A
Test Site: G
Date taken -----

Analysis report no. 71- 30994 page 1 of 2

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.00	xxxxx
% Ash	10.03	10.45
% Volatile	36.46	37.98
% Fixed Carbon	49.51	51.57
	100.00	100.00
Btu/lb.	12635	13161
% Sulfur	0.77	0.80

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.00	xxxxx
% Carbon	71.40	74.37
% Hydrogen	4.60	4.79
% Nitrogen	0.98	1.02
% Chlorine	0.10	0.10
% Sulfur	0.77	0.80
% Ash	10.03	10.45
% Oxygen(diff)	8.12	8.47
	100.00	100.00

FUSION TEMPERATURE OF ASH	Reducing
Initial Def.,IT ----	2700 °F
Softening, ST ------	2700+°F
Softening, HT ------	2700+°F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR		
% Pyritic	0.09	0.09
% Sulfate	0.05	0.05
% Organic	0.63	0.66

HARDGROVE GRINDABILITY INDEX: 38

FREE SWELLING INDEX: 1-1/2

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test site G
Sample taken by	KVB, Inc.
Date sampled	-----
Date received	5/3/79

Test No. Composite
Sample: A
Test site: G
Date taken: -----

Analysis report no. 71- 30994 page 2 of 2

[illegible]	Percent Weight Ignited Basis
	54.45
	29.56
	1.29
	7.15
	1.54
	0.98
	2.69
	0.44
	0.57
	0.18
	0.00
	0.24
	0.03
	0.88
	100.00

Alkalies as Na_2O	0.24		
[illegible]	84.92	Fouling index	0.03
Ba[illegible]	0.15	Slagging index	0.12

ESTIMATED VISCOSITY AT [illegible]

Temperature	---- F	----
T Temperature		2825

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COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-11

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KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal	Test No.	Composite Coal B
Sample taken at	Test Site G	Date taken	-----
Sample taken by	KVB, Inc.		
Date sampled	-----		
Date received	5/3/79		

Analysis report no. 71- 30995 page 1 of 2

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.32	xxxxx
% Ash	6.56	6.79
% Volatile	39.20	40.55
% Fixed Carbon	50.92	52.66
	100.00	100.00
Btu/lb.	13397	13857
% Sulfur	1.31	1.36

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.32	xxxxx
% Carbon	74.59	77.15
% Hydrogen	5.11	5.29
% Nitrogen	1.12	1.16
% Chlorine	0.18	0.19
% Sulfur	1.31	1.36
% Ash	6.56	6.79
% Oxygen(diff)	7.81	8.06
	100.00	100.00

FUSION TEMPERATURE OF ASH	Reducing
Initial Def.,IT ----	2420 °F
Softening, ST ------	2650 °F
Softening, HT ------	2680 °F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR		
% Pyritic	0.47	0.49
% Sulfate	0.04	0.04
% Organic	0.80	0.83

HARDGROVE GRINDABILITY INDEX: 37

FREE SWELLING INDEX: 2-1/2

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test site G
Sample taken by	KVB, Inc.
Date sampled	-----
Date received	5/3/79

Test No. Composite
Sample: B
Test site: G
Date taken: -----

Analysis report no. 71- 30995 page 2 of 2

MINERAL ANALYSIS OF ASH	Percent Weight Ignited Basis
Silica, SiO_2	43.26
Alumina, Al_2O_3	30.37
Titania, TiO_2	1.21
Ferric oxide, Fe_2O_3	13.50
Lime, CaO	3.43
Magnesia, MgO	1.32
Potassium oxide, K_2O	2.05
Sodium oxide, Na_2O	0.61
Sulfur trioxide, SO_3	3.61
Phos. pentoxide, P_2O_5	0.19
Strontium Oxide, SrO	0.10
Barium Oxide, BaO	0.26
Manganese Oxide, Mn_3O_4	0.02
Undetermined	0.07
	100.00

Alkalies as Na_2O, Dry Coal Basis = 0.13
Silica Value = 70.33
Base: Acid Ratio = 0.28

Fouling Index = 0.17
Slagging Index = 0.38

ESTIMATED VISCOSITY at critical [illegible]
Temperature of ---- F ---- [illegible]
T[illegible] Temperature [illegible] 2575 [illegible]

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

RAHouser
R. A. HOUSER, Manager, Midwest Division

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test Site G
Sample taken by	KVB, Inc.
Date sampled	-----
Date received	5/3/79

Test No. Composite
Coal D

Date taken -----

Analysis report no. 71- 30993 page 1 of 2

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.45	xxxxx
% Ash	7.24	7.58
% Volatile	37.07	38.80
% Fixed Carbon	51.24	53.62
	100.00	100.00
Btu/lb.	12912	13513
% Sulfur	0.65	0.68

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.45	xxxxx
% Carbon	72.91	76.31
% Hydrogen	4.86	5.09
% Nitrogen	0.96	1.00
% Chlorine	0.05	0.05
% Sulfur	0.65	0.68
% Ash	7.24	7.58
% Oxygen(diff)	8.88	9.29
	100.00	100.00

FUSION TEMPERATURE OF ASH

	Reducing
Initial Def.,IT ----	2700+°F
Softening, ST ------	2700+°F
Softening, HT ------	2700+°F
Fluid, FT ----------	2700+°F

FORMS OF SULFUR

	As Rec'd	Dry Basis
% Pyritic	0.08	0.08
% Sulfate	0.00	0.00
% Organic	0.57	0.60

HARDGROVE GRINDABILITY INDEX: 37

FREE SWELLING INDEX: 1-1/2

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 17, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	Test site G
Sample taken by	KVB, Inc.
Date sampled	4/4/79
Date received	5/3/79

Test No. Composite
Sample: D
Test site: G
Date taken: 4/4/79

Analysis report no. 71- 30993 page 2 of 2

MINERAL ANALYSIS OF ASH	Percent Weight Ignited Basis
Silica, SiO_2	52.38
Alumina, Al_2O_3	36.61
Titania, TiO_2	1.96
Ferric oxide, Fe_2O_3	3.75
Lime, CaO	1.19
Magnesia, MgO	0.77
Potassium oxide, K_2O	1.61
Sodium oxide, Na_2O	0.26
Sulfur trioxide, SO_3	0.65
Phos. pentoxide, P_2O_5	0.16
Strontium Oxide, SrO	0.06
Barium Oxide, BaO	0.13
Manganese Oxide, Mn_3O_4	0.00
Undetermined	0.47
	100.00

Alkalies as Na_2O, Dry Coal Basis = 0.10
Silica Value = 90.17
Base: Acid Ratio = 0.08
ESTIMATED VISCOSITY at critical viscosity
Temperature of ----°F = ---- Poises
T_{250} Temperature = 2900+ °F

Fouling Index = 0.02
Slagging Index = 0.05

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 2
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/11/79
Date received	5/3/79

Analysis report no. 71- 31085

%Combustible, dry basis.................... 12.53

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 3
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/11/79
Date received	5/3/79

Analysis report no. 71- 31086

%Combustible, dry basis.................... 7.26

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 4
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/16/79
Date received	5/3/79

Analysis report no 71- 31084

%Combustible, dry basis.................... 11.23

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser
R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
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6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 5
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/17/79
Date received	5/3/79

Analysis report no. 71- 31099

%Combustible, dry basis.................... 6.93

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/17/79
Date received	5/3/79

Test # 6
Test Site: G
Bottom Ash

Analysis report no. 71- 31095

%Combustible, dry basis.................... 7.11

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 7
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Analysis report no. 71- 31096

%Combustible, dry basis.................. 4.22

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 8
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Analysis report no. 71- 31094

%Combustible, dry basis.................... 6.02

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 9
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/28/79
Date received	5/3/79

Analysis report no. 71- 31089

%Combustible, dry basis..................	7.87
%Sulfur, dry basis........................	0.09

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/2/79
Date received	5/3/79

Bottom Ash
Test # 10
Test Site: G

Analysis report no. 71- 31088

%Combustible, dry basis.................. 9.77

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/16/79
Date received	5/3/79

Bottom Ash
Test # 15
Test Site: G

Analysis report no. 71- 31092

%Combustible, dry basis....................	14.88
%Sulfur, dry basis.........................	0.09

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

American Council of Independent Laboratories, Inc.
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification
by KVB, Inc.

Bottom Ash
Test # 16
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Analysis report no. 71- 31093

%Combustible, dry basis.................... 8.18

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us Ash

Sample taken at ----

Sample taken by KVB, Inc.

Date sampled 3/17/79

Date received 5/3/79

Bottom Ash
Test # 17
Test Site: G

Analysis report no. 71- 31087

%Combustible, dry basis.................. 7.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 18
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/18/79
Date received	5/3/79

Analysis report no. 71- 31091

%Combustible, dry basis.................... 13.93

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 19
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/18/79
Date received	5/3/79

Analysis report no. 71- 31090

%Combustible, dry basis.................... 8.79

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 20
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/21/79
Date received	5/3/79

Analysis report no. 71- 31100

%Combustible, dry basis	12.32
%Sulfur, dry basis	0.08

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 22
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/23/79
Date received	5/3/79

Analysis report no. 71- 31098

%Combustible, dry basis.................... 19.09

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 23
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/24/79
Date received	5/3/79

Analysis report no. 71- 31097

%Combustible, dry basis.................... 13.12

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Bottom Ash
Test # 24
Test Site: G

Kind of sample reported to us Ash

Sample taken at ----

Sample taken by KVB, Inc.

Date sampled 3/24/79

Date received 5/3/79

Analysis report no. 71- 31101

%Combustible, dry basis.................... 11.48

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/11/79
Date received	5/3/79

Dust Collector
Test # 2 & 3
Test Site: G

Analysis report no. 71- 31082

%Combustible, dry basis.................... 53.91

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 4
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/16/79
Date received	5/3/79

Analysis report no. 71- 31083

%Combustible, dry basis.................. 56.74

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 5 & 6
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/17/79
Date received	5/3/79

Analysis report no. 71- 31106

%Combustible, dry basis.................. 49.85

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 7
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Analysis report no. 71- 31111

%Combustible, dry basis.................... 50.05

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.
Charter Member

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 8
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/25/79
Date received	5/3/79

Analysis report no. 71- 31104

%Combustible, dry basis.................. 56.65

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

209 R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 9
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	2/28/79
Date received	5/3/79

Analysis report no. 71- 31114

%Combustible, dry basis....................	55.71
%Sulfur, dry basis.........................	0.44

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 10
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/2/79
Date received	5/3/79

Analysis report no. 71- 31108

%Combustible, dry basis.................... 42.73

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 15
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/16/79
Date received	5/3/79

Analysis report no. 71- 31109

%Combustible, dry basis	40.65
%Sulfur, dry basis	0.42

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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Hauser

[illegible] Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

KVB, Inc.

Multiclone Ash
Test # 16 & 17
Test Site: G

Kind of sample submitted as	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Analysis report no. 71- 31110

%Combustible, dry basis.................... 57.30

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/17/79
Date received	5/3/79

Fly Ash
Test # 17
Test Site: G
from reinjector

Analysis report no. 71- 31115

%Combustible, dry basis.................. 83.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 18
Test Site: G

Kind of sample reported to us: Ash
Sample taken at: ----
Sample taken by: KVB, Inc.
Date sampled: 3/18/79
Date received: 5/3/79

Analysis report no. 71- 31113

%Combustible, dry basis.................... 51.15

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification
by KVB, Inc.

Multiclone Ash
Test # 19
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/18/79
Date received	5/3/79

Analysis report no. 71- 31112

%Combustible, dry basis.................. 62.51

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

KVB, Inc.

Multiclone Ash
Test # 20
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/21/79
Date received	5/3/79

Analysis report no. 71- 31105

%Combustible, dry basis....................	57.09
%Sulfur, dry basis.........................	0.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification
by KVB, Inc.

Multiclone Ash
Test # 22
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/23/79
Date received	5/3/79

Analysis report no. 71- 31102

%Combustible, dry basis.................. 67.03

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 23
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/24/79
Date received	5/3/79

Analysis report no. 71- 31103

%Combustible, dry basis.................... 57.57

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

May 14, 1979

Sample identification by KVB, Inc.

Multiclone Ash
Test # 24
Test Site: G

Kind of sample reported to us	Ash
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	3/24/79
Date received	5/3/79

Analysis report no. 71- 31107

%Combustible, dry basis.................... 56.15

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager Midwest Division

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COMBUSTIBLES DATA SHEET

SITE 6

Crucible Number	Sample Origin		Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combus-tibles
39	TEST #3 BLR OUT		10.0010	10.7173	0.7164	10.3431	0.3743	52.2
			10.0010	10.7174		10.3430		
		AVG.	10.0010	10.7174		10.3431		
38	TEST #2 BLR OUT		10.1483	11.1241	0.9759	10.5572	0.5668	58.1
			10.1482	11.1243		10.5576		
		AVG.	10.1483	11.1242		10.5574		
40	TEST #6 BLR OUT		9.2524	9.9193	0.6670	9.6013	0.3182	47.7
			9.2525	9.9197		9.6012		
		AVG.	9.2525	9.9195		9.6013		
41	TEST #7 BLR OUT		9.8835	10.3878	0.5041	10.1487	0.2390	47.4
			9.8834	10.3873		10.1484		
		AVG.	9.8835	10.3876		10.1486		
42	TEST #10 BLR OUT		10.3697	11.3369	0.9670	10.7852	0.5516	57.0
			10.3700	11.3368		10.7853		
		AVG.	10.3699	11.3369		10.7853		
43	TEST #16 BLR OUT		9.8502	10.2285	0.3782	10.0483	0.1800	47.6
			9.8501	10.2283		10.0485		
		AVG.	9.8502	10.2284		10.0484		
20	TEST #19 BLR OUT		8.8423	9.1105	0.2683	8.9762	0.1343	50.1
			8.8422	9.1107		8.9763		
		AVG.	8.8423	9.1106		8.9763		
21	B. #51 #22 BLR OUT		9.4816	10.3321	0.8506	9.8666	0.4657	54.7
			9.4816	10.3323		9.8663		
		AVG.	9.4816	10.3322		9.8665		
22	B #53 #23 BLR OUT		9.7282	10.5350	0.8069	10.1272	0.4080	50.6
			9.7282	10.5352		10.1270		
		AVG.	9.7282	10.5351		10.1271		
23	B #55 #24 BLR OUT		10.1035	10.7920	0.6886	10.3590	0.4330	62.9
			10.1035	10.7921		10.3592		
		AVG.	10.1035	10.7921		10.3591		
		AVG.						

COMBUSTIBLES DATA SHEET

SITE 6 — MECH

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combus-tibles
1	TEST #3 MECH OUT	3.6814	3.7066	0.0251	3.6992	0.0073	29.1
		3.6812	3.7061		3.6989		
		—	—		—		
	AVG.	3.6813	3.7064		3.6991		
2	TEST #4 MECH -	3.9729	3.9976	0.0246	3.9905	0.0071	28.9
		3.9729	3.9974		3.9902		
		—	—		—		
	AVG.	3.9729	3.9975		3.9904		
3	TEST #7 MECH	3.6690	3.6928	0.0238	3.6800	0.0129	54.2
		3.6689	3.6927		3.6798		
		—	—		—		
	AVG.	3.6690	3.6928		3.6799		
4	TEST #8 MECH	3.7108	3.7188	0.0081	3.7160	0.0028	34.6
		3.7107	3.7189		3.7161		
		—			—		
	AVG.	3.7108	3.7189		3.7161		
6	TEST #10 MECH	3.7402	3.7633	0.0231	3.7582	0.0053	22.9
		3.7401	3.7632		3.7578		
		—	—		—		
	AVG.	3.7402	3.7633		3.7580		
7	TEST #16 MECH	3.7839	3.8710	0.0870	3.8563	0.0146	16.8
		3.7839	3.8708		3.8562		
		—	—		—		
	AVG.	3.7839	3.8709		3.8563		
8	TEST #17 MECH	3.8307	3.9267	0.0961	3.8993	0.0276	28.7
		3.8308	3.9270		3.8992		
		—	—		—		
	AVG.	3.8308	3.9269		3.8993		
11	TEST #18 MECH	3.7119	3.7909	0.0791	3.7677	0.0233	29.5
		3.7117	3.7909		3.7674		
		—	—		—		
	AVG.	3.7118	3.7909		3.7676		
34	TEST #19 MECH	10.1719	10.1900	0.0181	10.1805	0.0096	53.0
		10.1720	10.1902		10.1804		
		—	—		—		
	AVG.	10.1720	10.1901		10.1805		
35	TEST #22 MECH	9.8311	9.8941	0.0630	9.8763	0.0180	28.6
		9.8312	9.8943		9.8761		
		—	—		—		
	AVG.	9.8312	9.8942		9.8762		
36	TEST #23 MECH	9.4585	9.5373	0.0787	9.5148	0.0227	28.8
		9.4586	9.5373		9.5144		
			—		—		
	AVG.	9.4586	9.5373		9.5146		

[illegible]TIBLES [illegible]

SITE G-Mech

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 1[illegible]°C [illegible]ms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
37	TEST #24 MECH	10.2083	10.2[illegible]	0.0[illegible]	10.2418	0.0144	30.2
		10.2084	10.25[illegible]		10.2415		
		—	—		—		
	AVG.	10.2084	10.2561		10.2417		
24	SITE 6 TEST #5 Boiler OUT	10.4908	10.4515	0.[illegible]9	10.7227	0.2290	49.7
		10.4908	10.4518		10.7227		
	AVG.	10.4908	10.4517		10.7227		
	AVG.						
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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 2

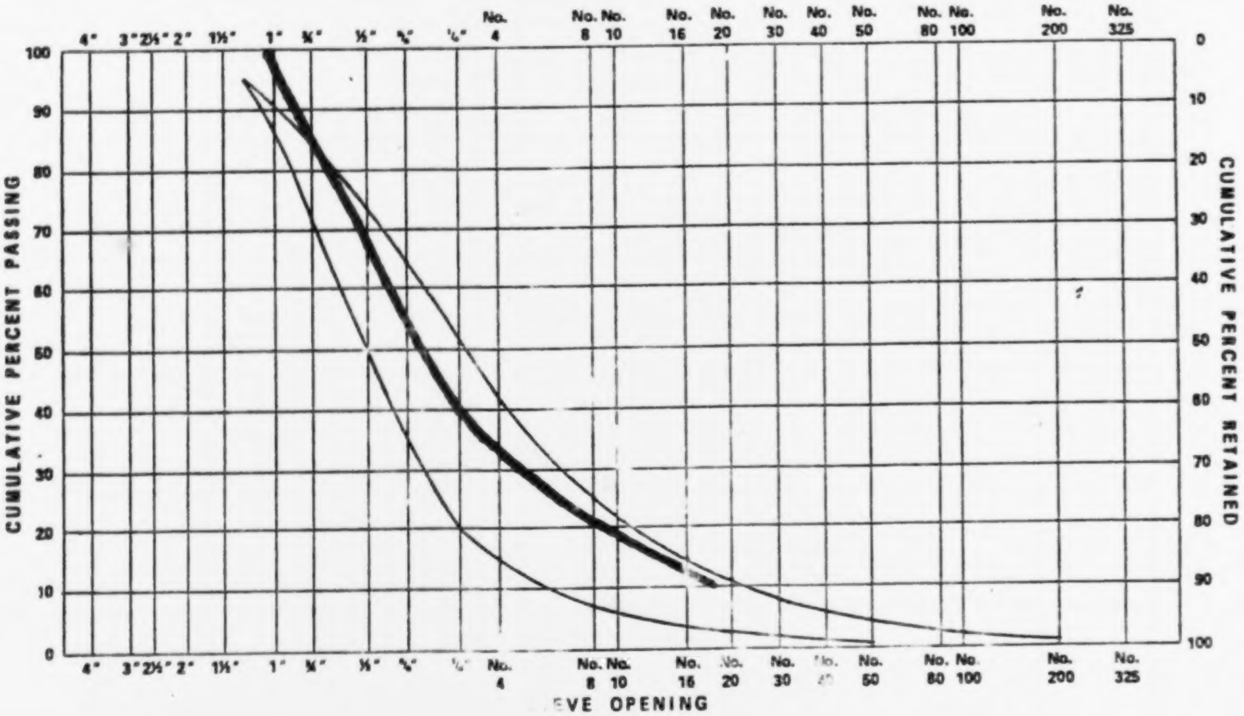
DATE SAMPLE TAKEN 2-11-79

TEST SITE G

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	89.2	254.1	164.9	2.5	66464	100.0	4
1"	110.0	540.2 1713.5	2033.7	30.6	64815	97.5	4
½"	↓	508.0 1532.0	1820.0	27.4	44478	669	4
¼"		1386.7	1276.7	19.2	2627.8	395	4
#8		612.9	502.9	7.6	1351.1	203	4
#16	↓	958.2	848.2	12.8	848.2	127	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 3

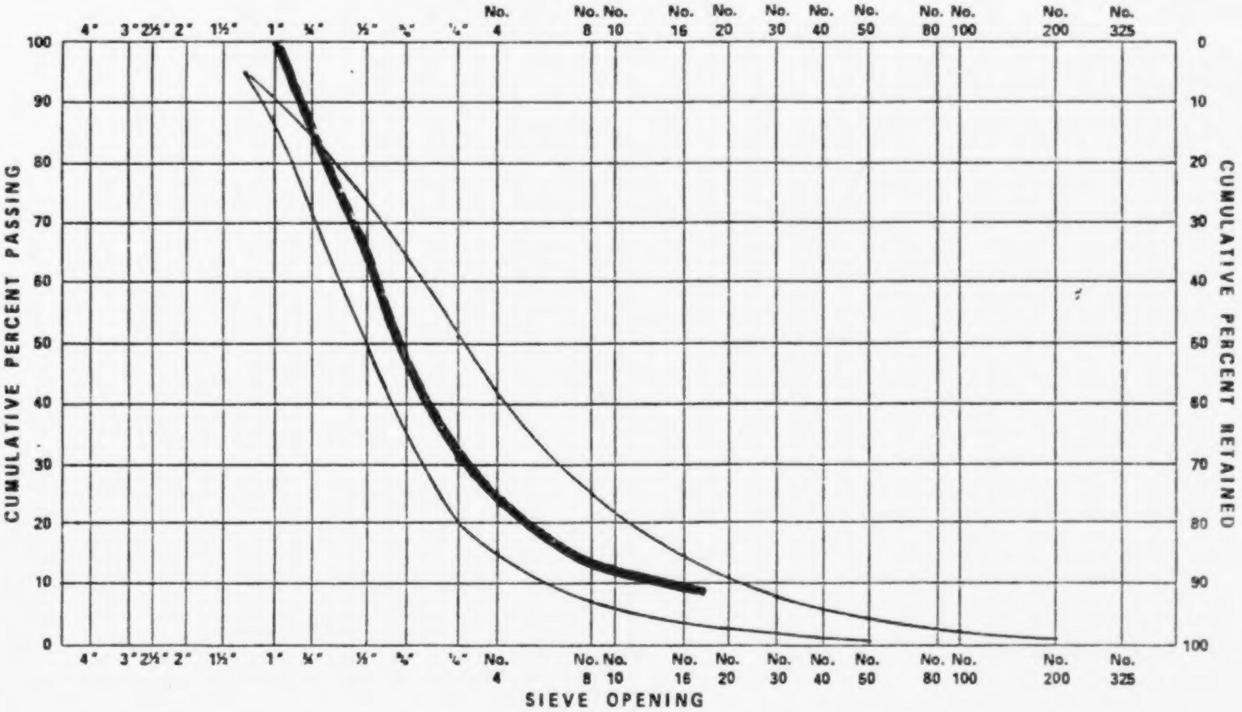
DATE SAMPLE TAKEN 2-11-79

TEST SITE G

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.4	135.5	25.1	0.7	3446.6	100.0	4
1"		1315.8	1205.4	35.0	3421.5	99.3	4
1/2"		1268.8	1158.4	33.6	2216.1	64.3	4
1/4"		694.7	584.3	17.0	1057.7	30.7	4
#8		274.8	164.4	4.8	473.4	13.7	4
#16		419.4	309.0	9.0	309.0	8.9	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 4

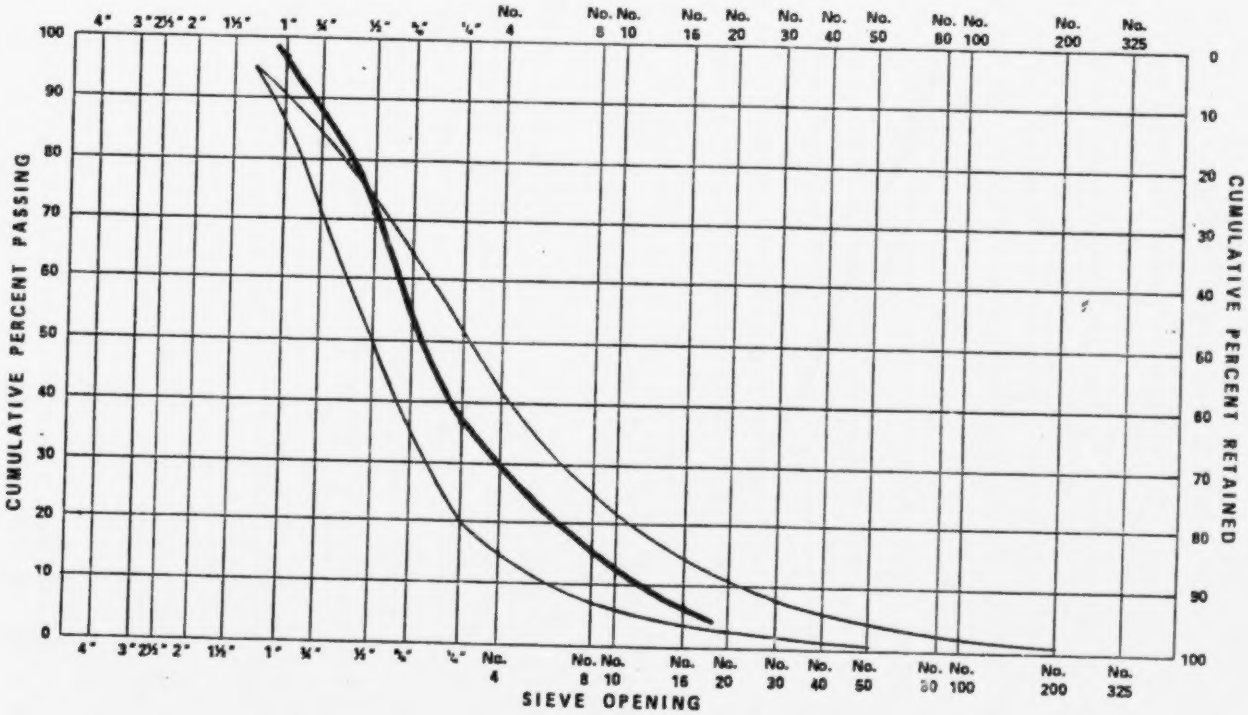
TEST SITE C

SAMPLE IDENTIFICATION A

DATE SAMPLE TAKEN 2-16-79

TEST PERFORMED BY JB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.2	388.6	278.4	3.1	8878.2	100.0	4
1"	↓	1392.1 1126.4	2298.1	25.9	8599.8	96.9	4
1/2"		1134.9 6518 1621.4	3077.5	34.7	6301.7	71.0	4
1/4"		1082.9 1042.0	1904.5	21.5	3224.2	36.3	4
#8		911.9	801.7	9.0	1319.7	14.8	4
#16		628.2	518.0	5.8	518.0	5.8	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 5

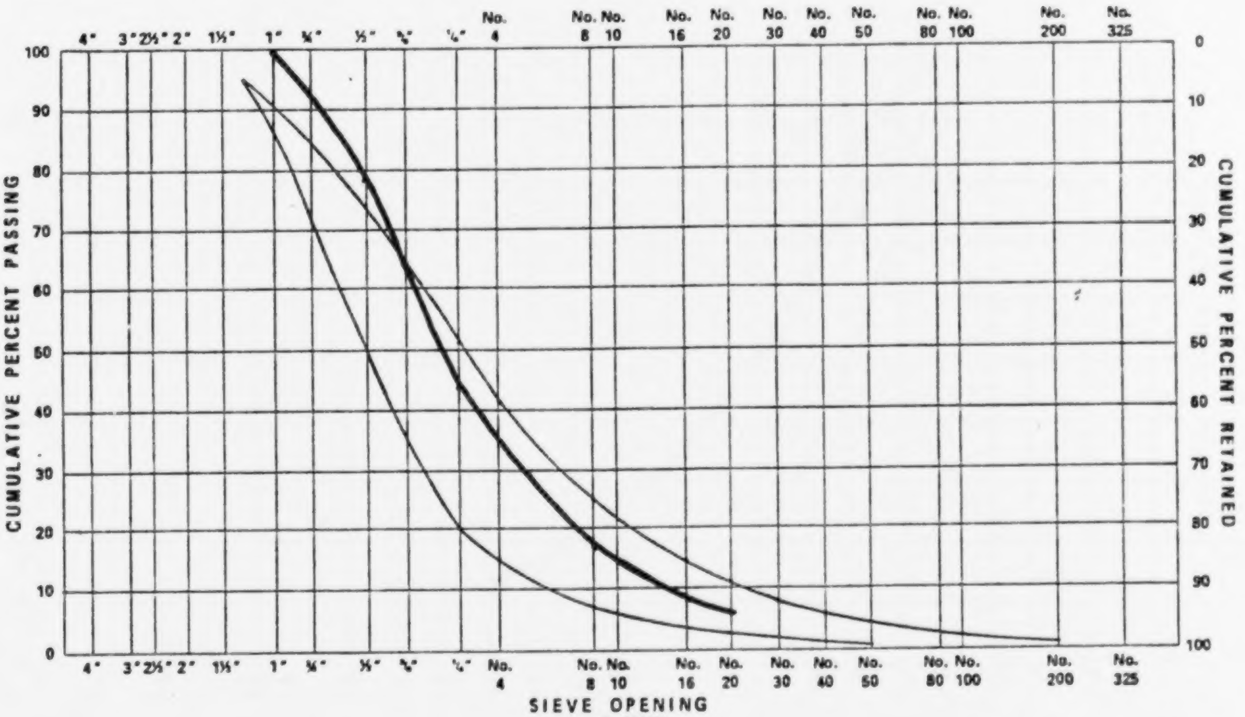
TEST SITE 6

SAMPLE IDENTIFICATION A

DATE SAMPLE TAKEN 2-13-79

TEST PERFORMED BY [illegible]

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1102	1235 1401	43.2	0.6	7695.2	100.0	4
1"	↓	914.3 932.5	1626.4	21.1	7652.0	99.4	4
1/2"		1183.3 1467.0	2719.7	35.3	6025.6	78.3	4
1/4"		788.8 1208.8	1997.2	25.8	3305.9	43.0	4
#8		852.9	742.7	9.7	1318.7	17.2	4
#16	↓	686.7	576.0	7.5	576.0	7.5	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 6

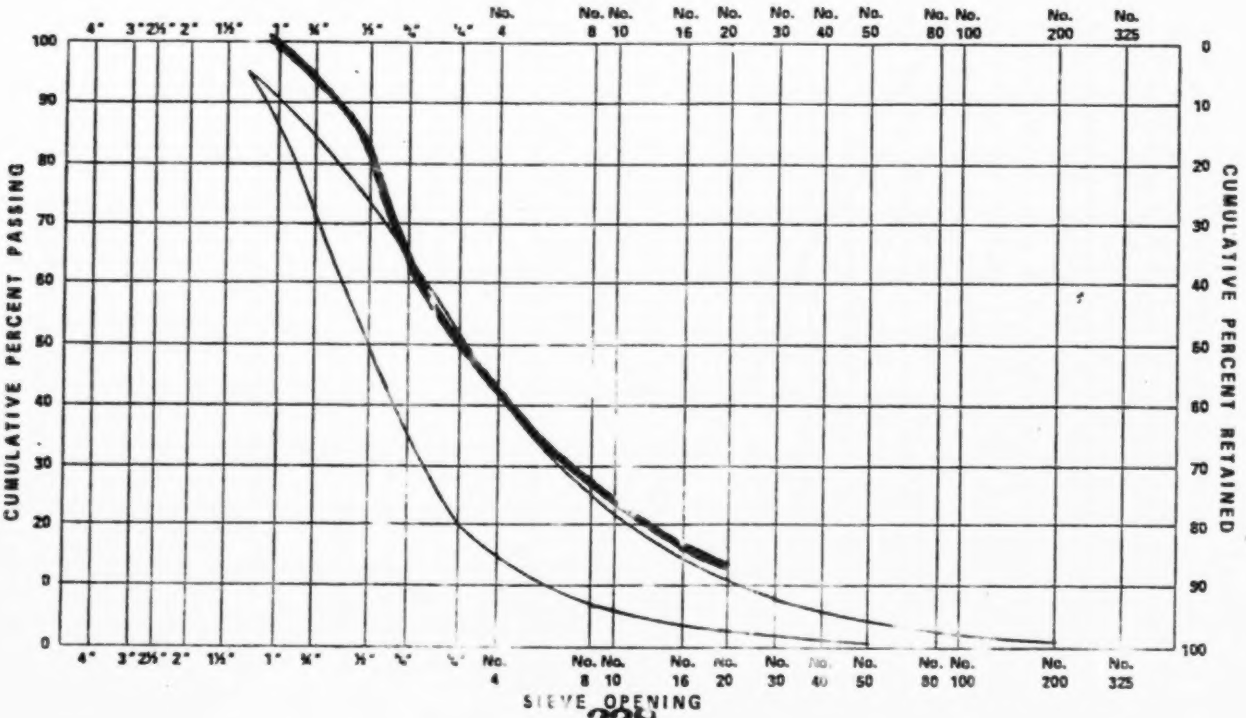
DATE SAMPLE TAKEN 2-17-79

TEST SITE 6

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.9	191.9	81.0	0.9	9174.6	100.0	4
1"	↓	1648.1	1537.2	16.8	9093.6	99.2	4
1/2"		1632.4 1581.0	2991.6	32.6	7556.4	82.4	4
1/4"		1131.0 1215.6	2124.8	23.2	4564.8	49.8	4
#8		1076.7	965.8	10.5	2440.0	26.6	4
#16		596.8 1099.2	1474.2	16.1	1474.2	16.1	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 7

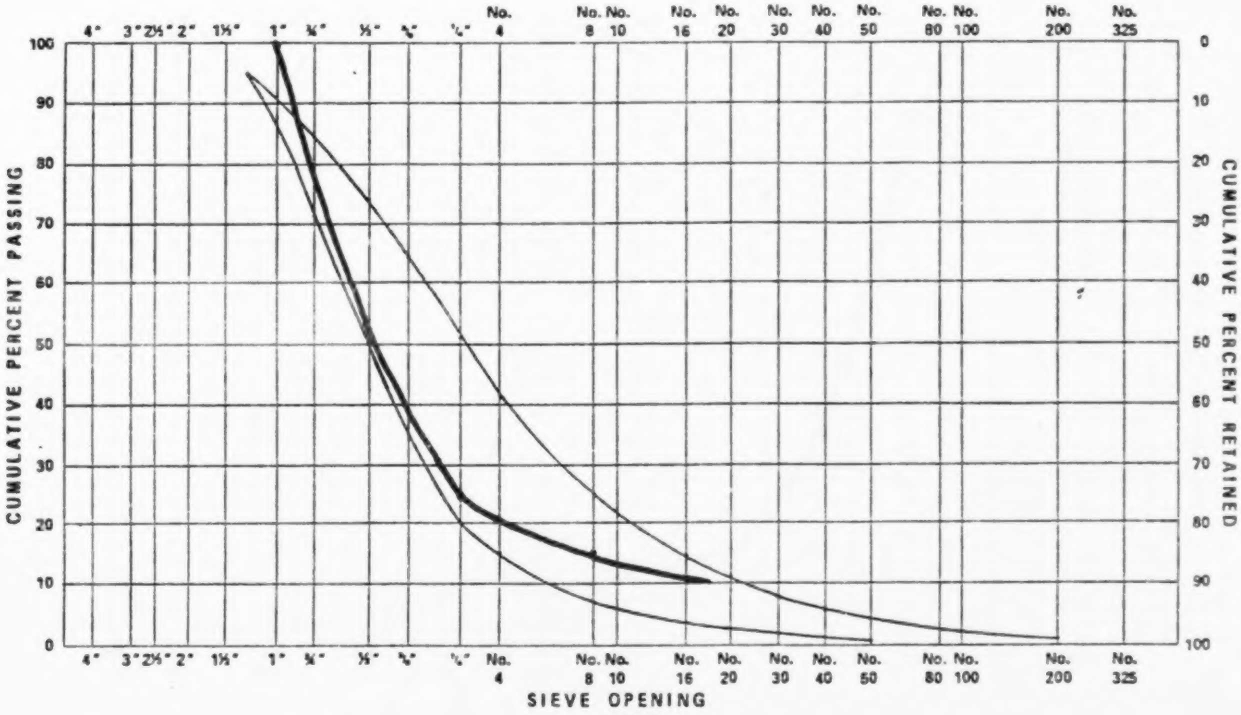
DATE SAMPLE TAKEN 2-25-79

TEST SITE C

TEST PERFORMED BY J.B

SAMPLE IDENTIFICATION B

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.9	151.0	40.1	0.5	8543.3	100.0	4
1"		1272.4 1916.0 1295.4	4151.1	48.6	8503.2	99.6	4
1/2"		1197.9 1312.1	2288.2	26.8	4352.1	51.0	4
1/4"		910.0	799.1	9.4	2063.9	24.2	4
#8		470.9	360.0	4.2	1264.8	14.8	4
#16		1015.7	904.8	10.6	904.8	10.6	4



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SIEVE ANALYSIS TEST REPORT

TEST NO. 8

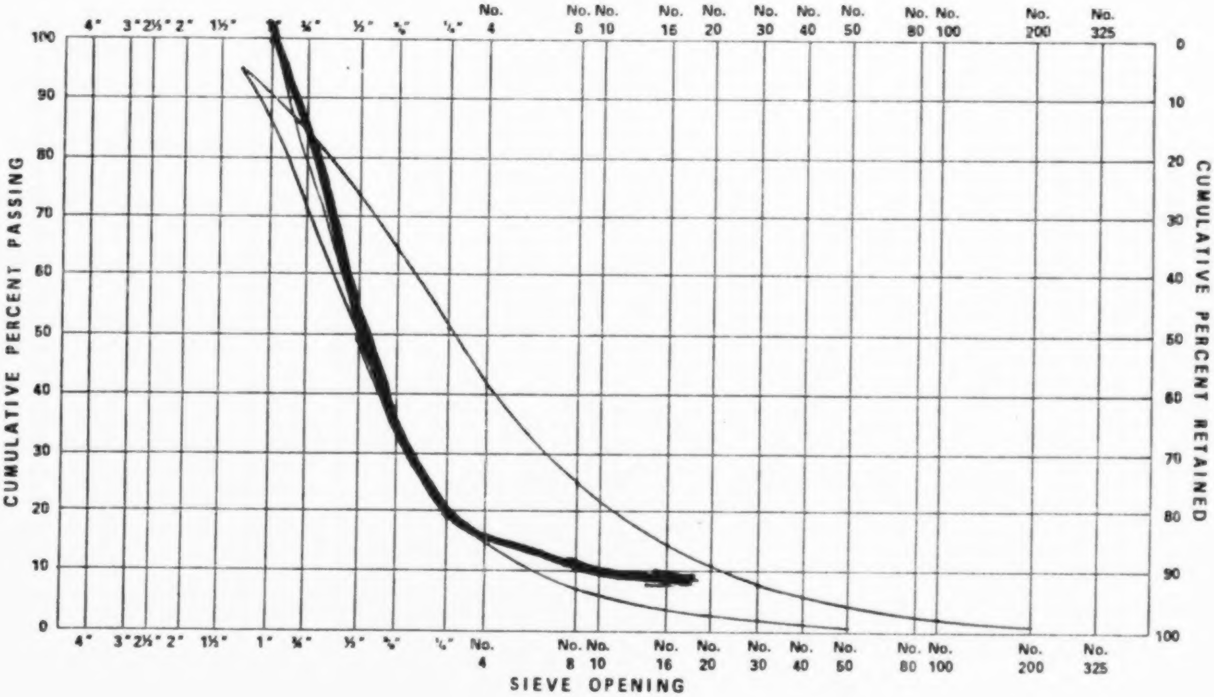
DATE SAMPLE TAKEN 2-25-79

TEST SITE 6

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION B

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.9	110.9	0	0	8484.8	100.0	4
1"		15399 13200 1803.4	4330.6	51.0	8484.8	100.0	4
½"		12459 15117	2535.8	29.9	4154.2	49.0	4
¼"		7698	658.9	7.8	1618.4	19.1	4
#8		369.6	258.7	3.0	959.5	11.3	4
#16		811.7	700.8	8.3	700.8	8.3	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 9

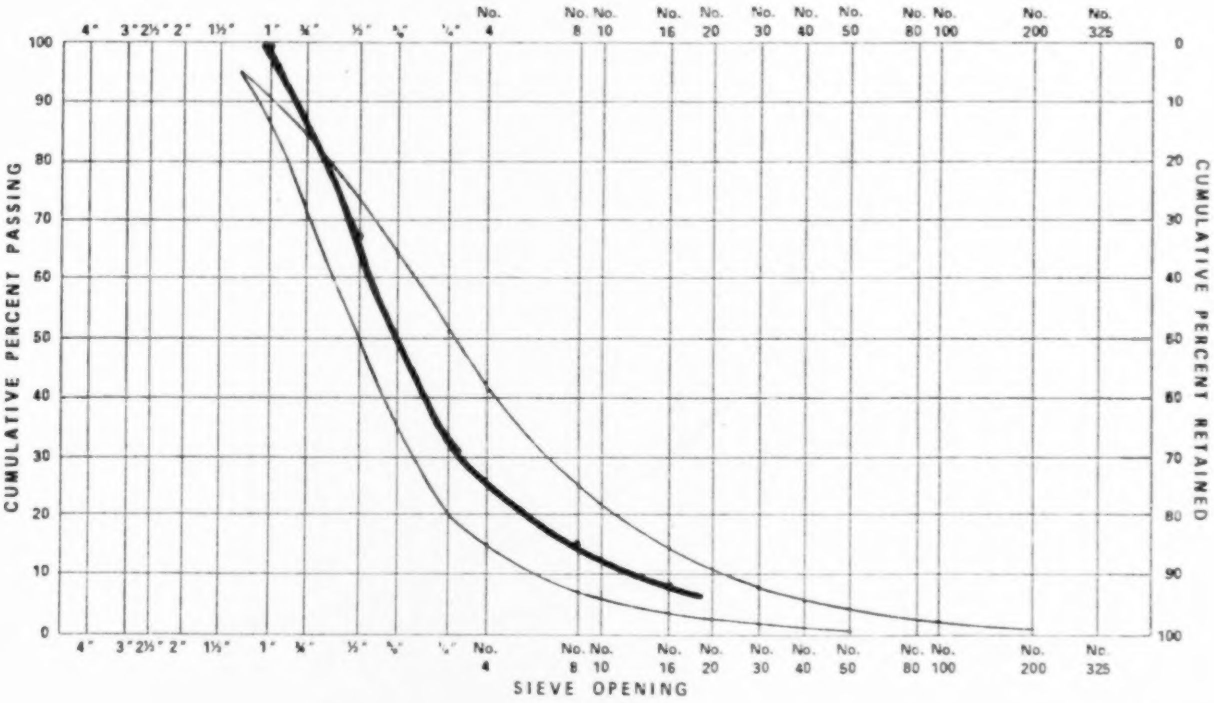
DATE SAMPLE TAKEN 2-28-79

TEST SITE G

TEST PERFORMED BY JoB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1103	187.4	77.1	1.0	7901.8	100.0	4
1"		1167.7 1669.9	2617.0	33.1	7824.7	99.0	4
½"		1379.6 1503.8	2662.8	33.7	5207.7	65.9	4
¼"		1466.2	1355.9	17.2	2544.9	32.2	4
#8		653.7	543.4	6.9	1189.0	15.0	4
#16		755.9	645.6	8.2	645.6	8.1	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 10

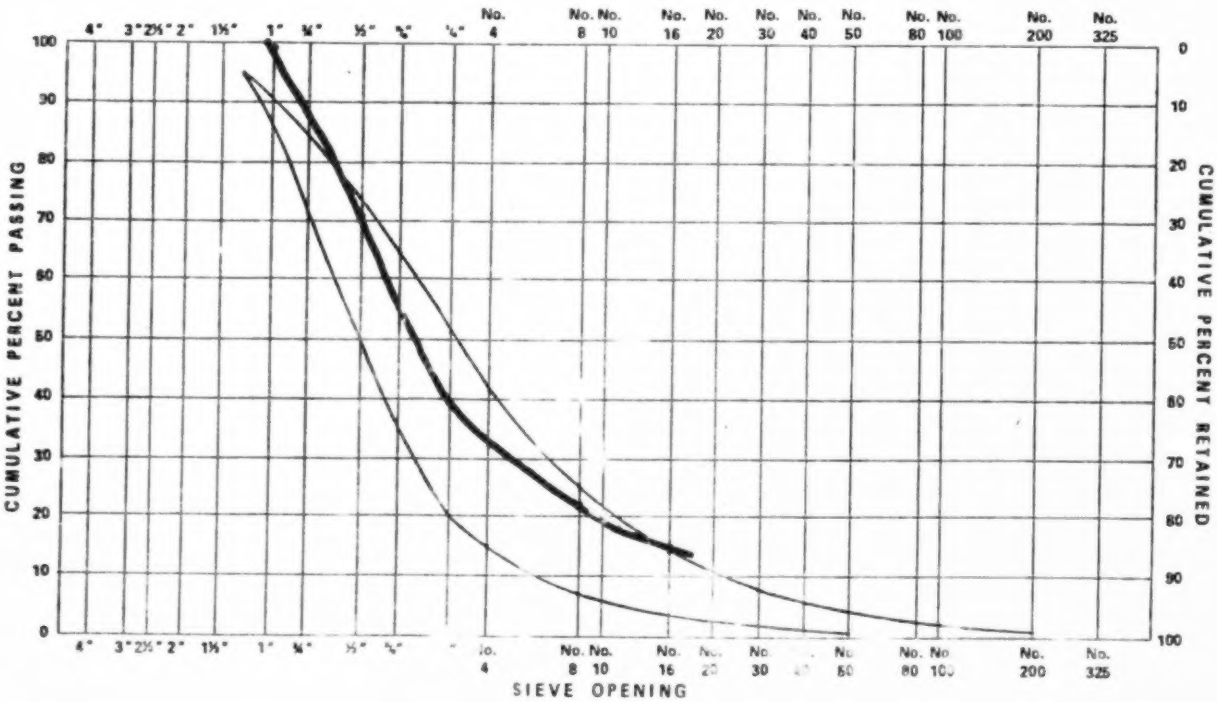
DATE SAMPLE TAKEN 3-2-79

TEST SITE 6

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	190.3	80.3	1.1	6992.5	100.0	4
1"	↓	773.6 1435.3	1988.9	28.4	6912.2	98.9	4
1/2"		1150.4 1252.2	2182.6	31.2	4923.3	70.5	4
1/4"		1333.6	1223.6	17.5	2740.7	39.3	4
#8		563.7	453.7	6.5	1517.1	21.8	4
#16		1173.4	1063.4	15.2	1063.4	15.3	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 15

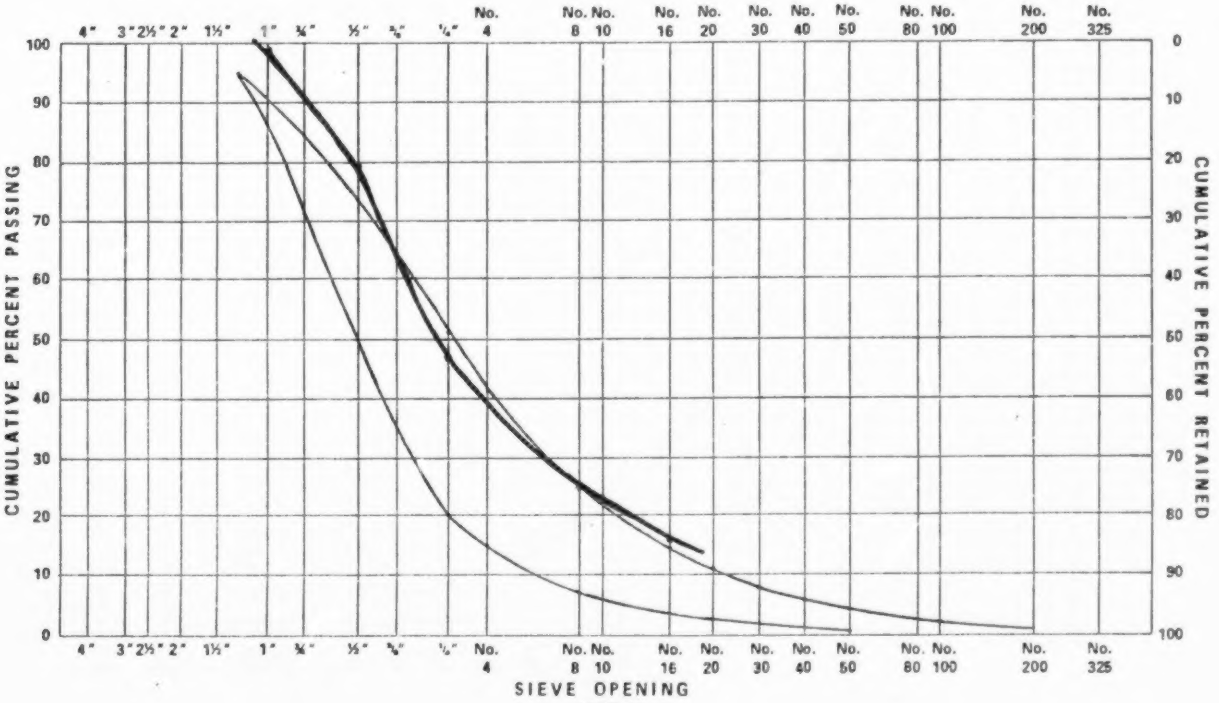
TEST SITE G

SAMPLE IDENTIFICATION A

DATE SAMPLE TAKEN JOB

TEST PERFORMED BY 3-15-79

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.0	200.0	90.0	1.5	5934.7	100.0	4
1"		1230.4	1120.4	18.9	5844.7	98.5	4
½"		1118.4 1058.1	1956.5	33.0	4724.3	79.5	4
¼"		746.4 772.1	1298.5	21.9	2767.8	46.6	4
#8		676.7	566.7	9.5	1469.3	24.7	4
#16		1012.6	902.6	15.2	902.6	15.2	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 16

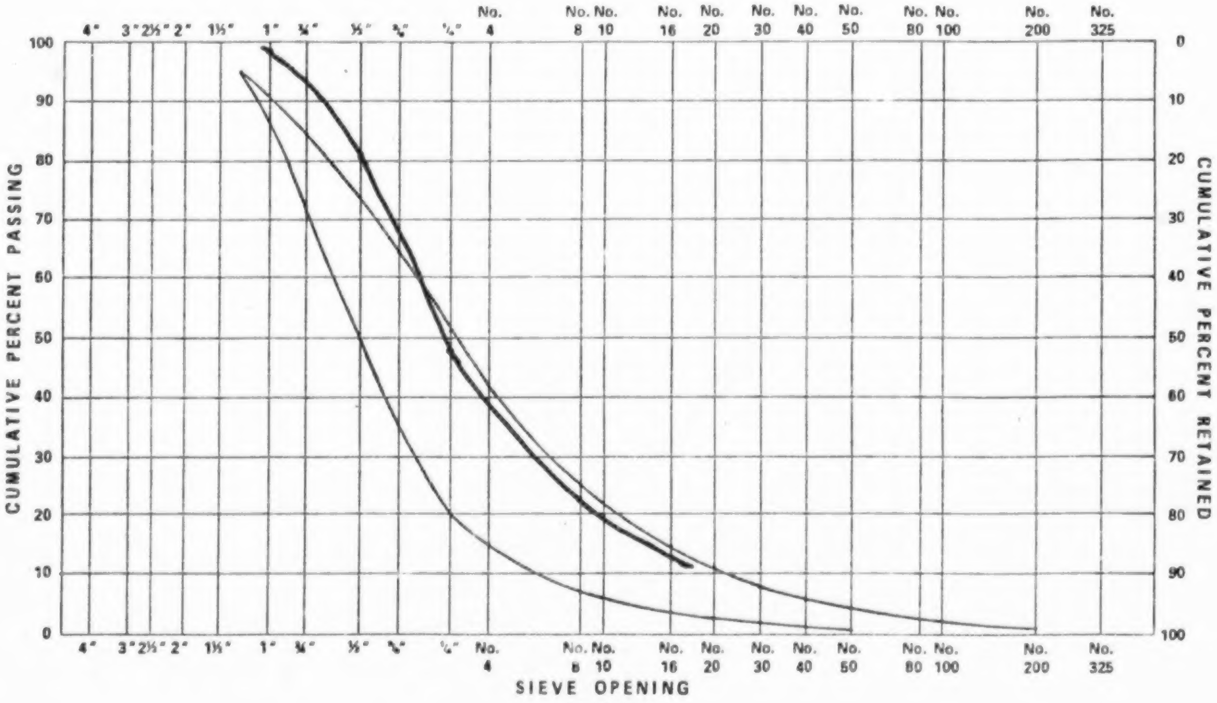
DATE SAMPLE TAKEN 3-17-79

TEST SITE 6

TEST PERFORMED BY VOB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	190.0	80.0	1.7	4662.7	100.0	4
1"		934.3	824.3	17.7	4582.7	98.3	4
1/2"		1641.5	1531.5	32.8	3758.4	80.6	4
1/4"		1277.0	1167.0	25.0	2226.9	47.8	4
#8		565.4	455.4	9.8	1059.9	22.8	4
#16		714.5	604.5	13.0	604.5	13.0	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 17

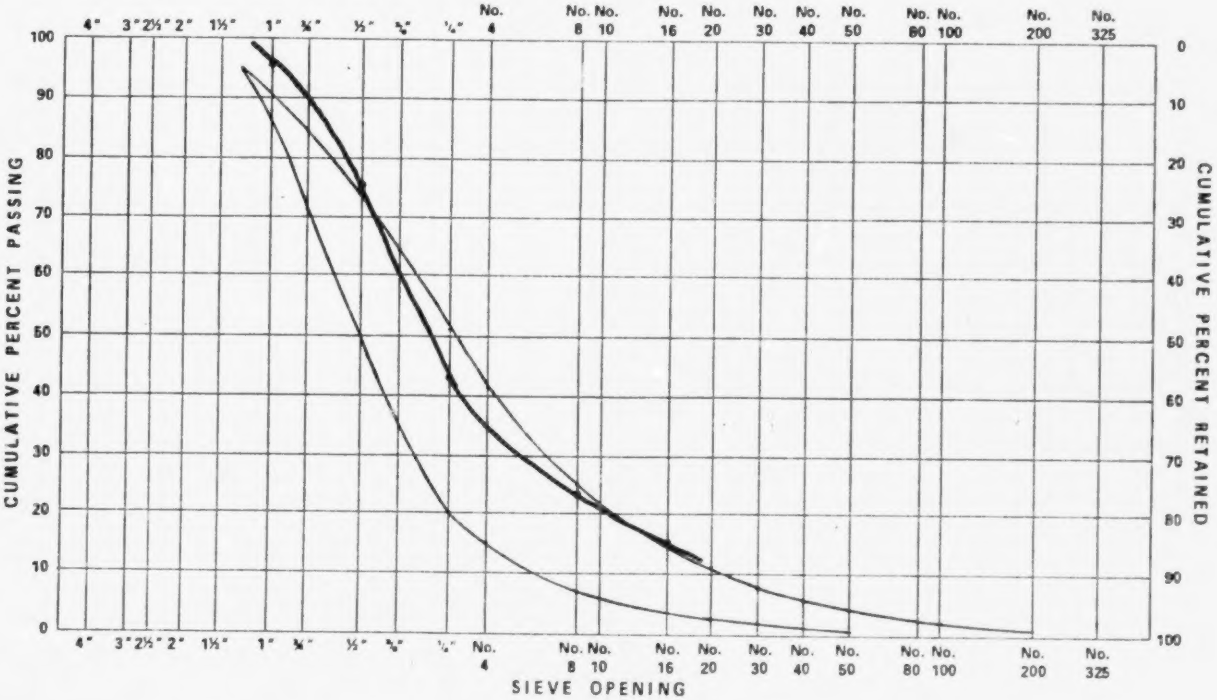
DATE SAMPLE TAKEN 3-17-79

TEST SITE 6

TEST PERFORMED BY JCB

SAMPLE IDENTIFICATION A

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.8	361.6	250.8	4.3	5816.5	100.0	4
1"		1311.0	1200.2	20.6	5565.7	95.6	4
1/2"		991.3 1093.9	1863.6	32.0	4365.5	75.0	4
1/4"		1274.8	1164.0	20.0	2501.9	43.0	4
#8		577.0	466.2	8.0	1337.9	23.0	4
[illegible]		982.5	871.7	15.0	871.7	15.0	4

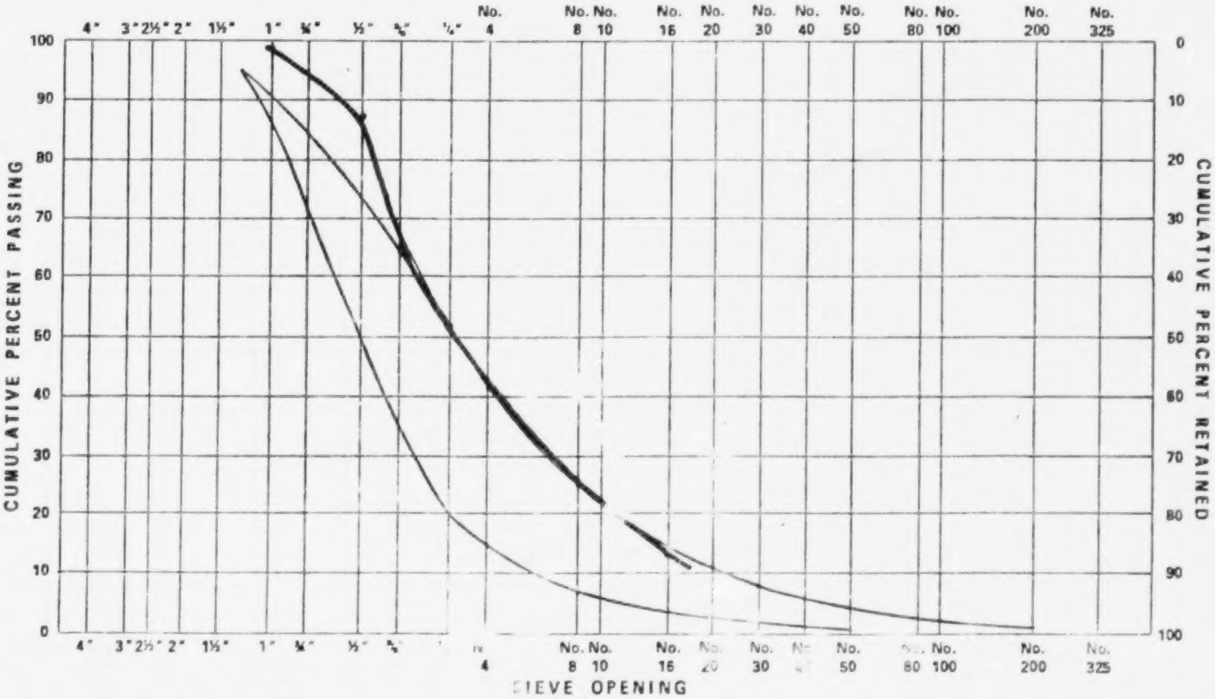


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 18
DATE SAMPLE TAKEN 3-18-79
TEST SITE 6
TEST PERFORMED BY JCB
SAMPLE IDENTIFICATION D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	191.3	81.3	1.4	5978.3	100.0	4
1"		846.9	736.9	12.3	5897.0	98.6	4
½"		780.7 1493.0	2053.7	34.4	5160.1	86.3	4
¼"		735.6 1130.6	1646.2	27.5	3106.4	51.9	4
#8		715.3	605.3	10.1	1460.2	24.4	4
#16	↓	964.9	854.9	14.3	854.9	14.3	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 19

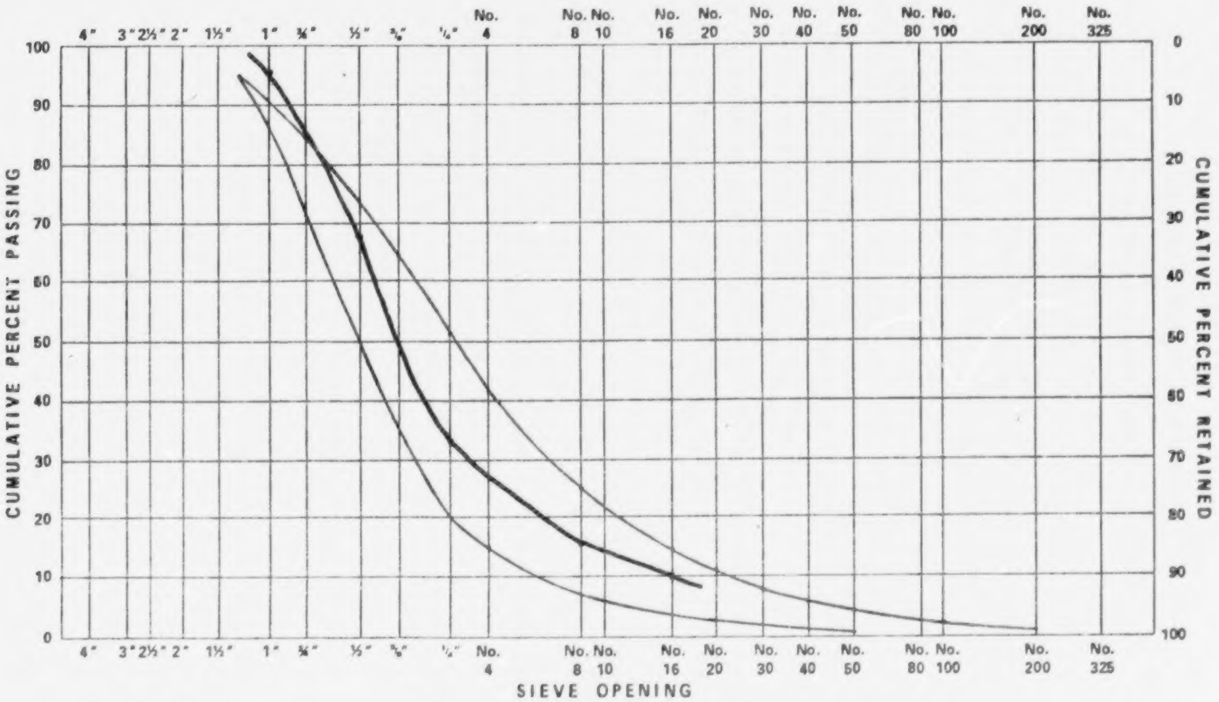
DATE SAMPLE TAKEN 3-18-79

TEST SITE G

TEST PERFORMED BY JCB

SAMPLE IDENTIFICATION D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.2	391.2	281.0	4.3	6510.5	100.0	4
1"	↓	998.1 1038.6	1816.3	27.9	6229.5	95.7	4
½"		1144.0 1304.6	2228.2	34.2	4413.2	67.8	4
¼"		1299.7	1189.5	18.3	2185.0	33.6	4
#8		460.4	350.2	5.4	995.5	15.3	4
#16	↓	755.5	645.3	9.9	645.3	9.9	4



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SIEVE ANALYSIS TEST REPORT

TEST NO. 20

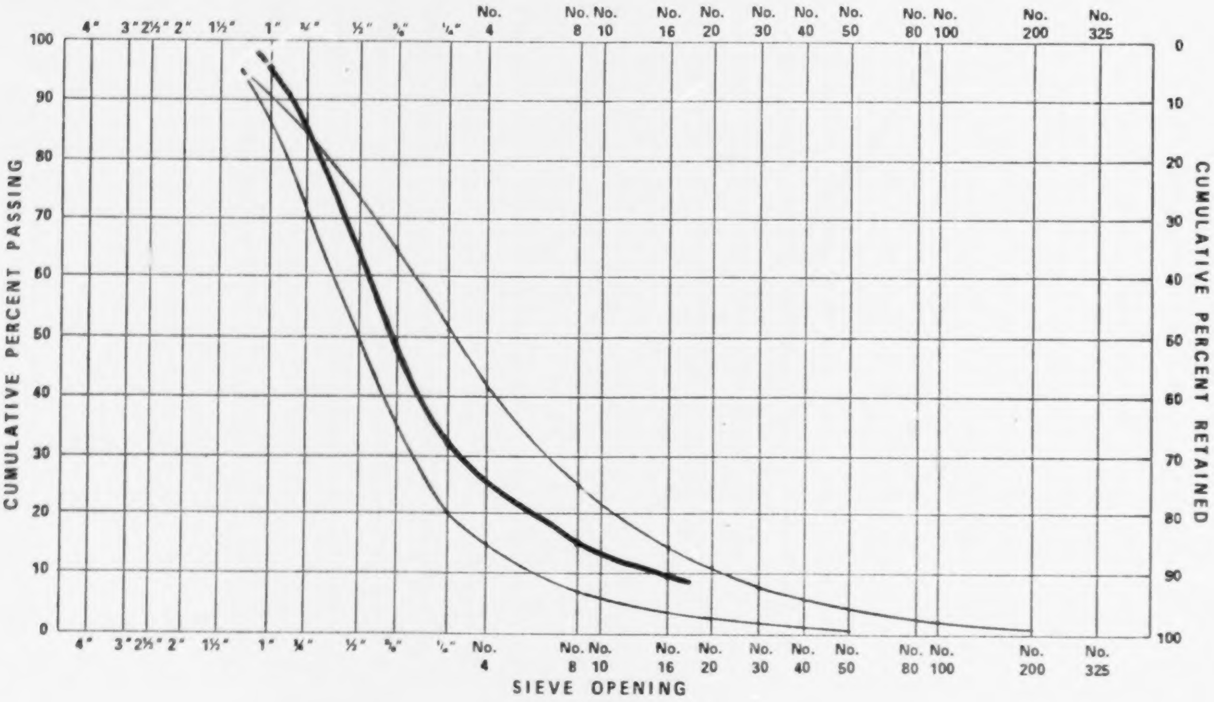
DATE SAMPLE TAKEN [illegible]

TEST SITE 6

TEST PERFORMED BY JB

SAMPLE IDENTIFICATION D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	309.7	199.7	3.5	5708.1	100.0	4
1"	↓	1944.7	1834.7	32.1	5508.4	96.5	4
3/4"		861.8 1197.7	1845.5	32.3	3673.7	64.4	4
1/4"		1105.2	996.2	17.4	1828.2	32.1	4
#8		401.7	291.7	5.1	833.0	14.6	4
#16	↓	651.3	541.3	9.5	541.3	9.6	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 22

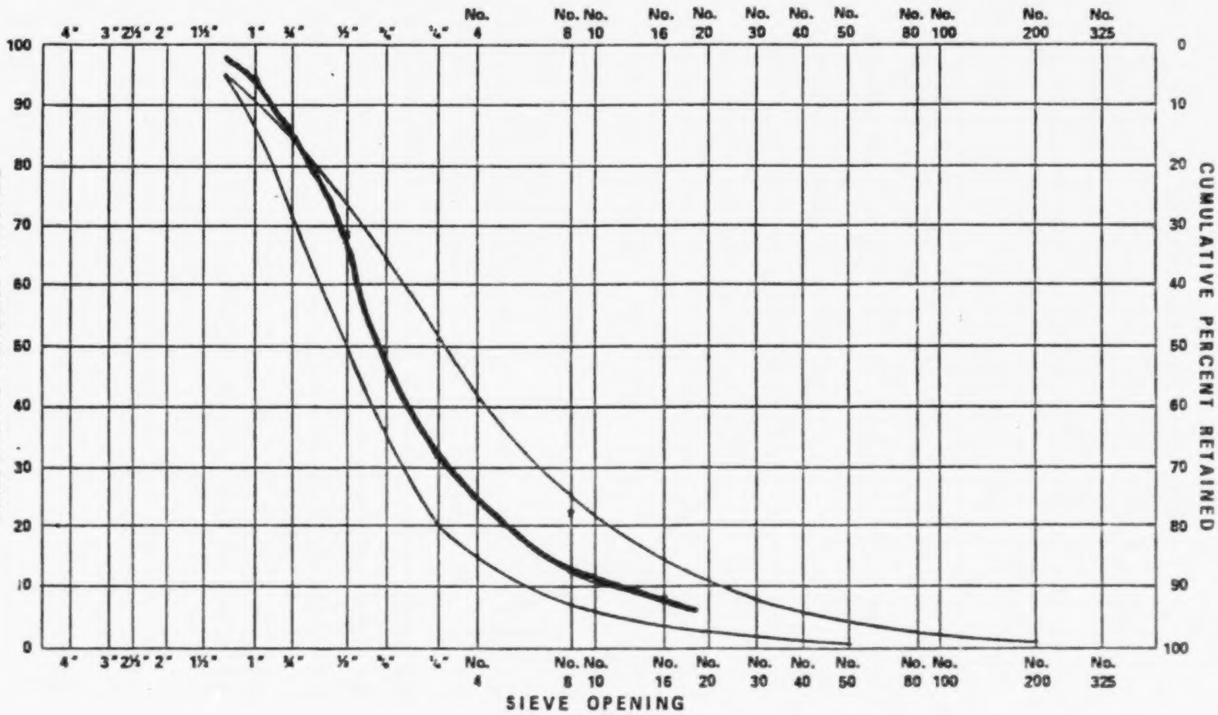
DATE SAMPLE TAKEN 3-23-79

TEST SITE 6

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	447.1	337.1	5.8	5830.7	100.0	4
1"	|	~~1584.5~~	1474.5	25.3	5493.6	94.2	4
½"	|	~~1192.5~~ ~~1186.5~~	2159.0	37.0	4019.1	68.9	4
¼"	|	1197.6	1087.6	18.7	1860.1	31.9	4
#8	|	413.5	303.5	5.2	772.5	13.2	4
#16	√	579.0	469.0	8.0	469.0	8.0	4

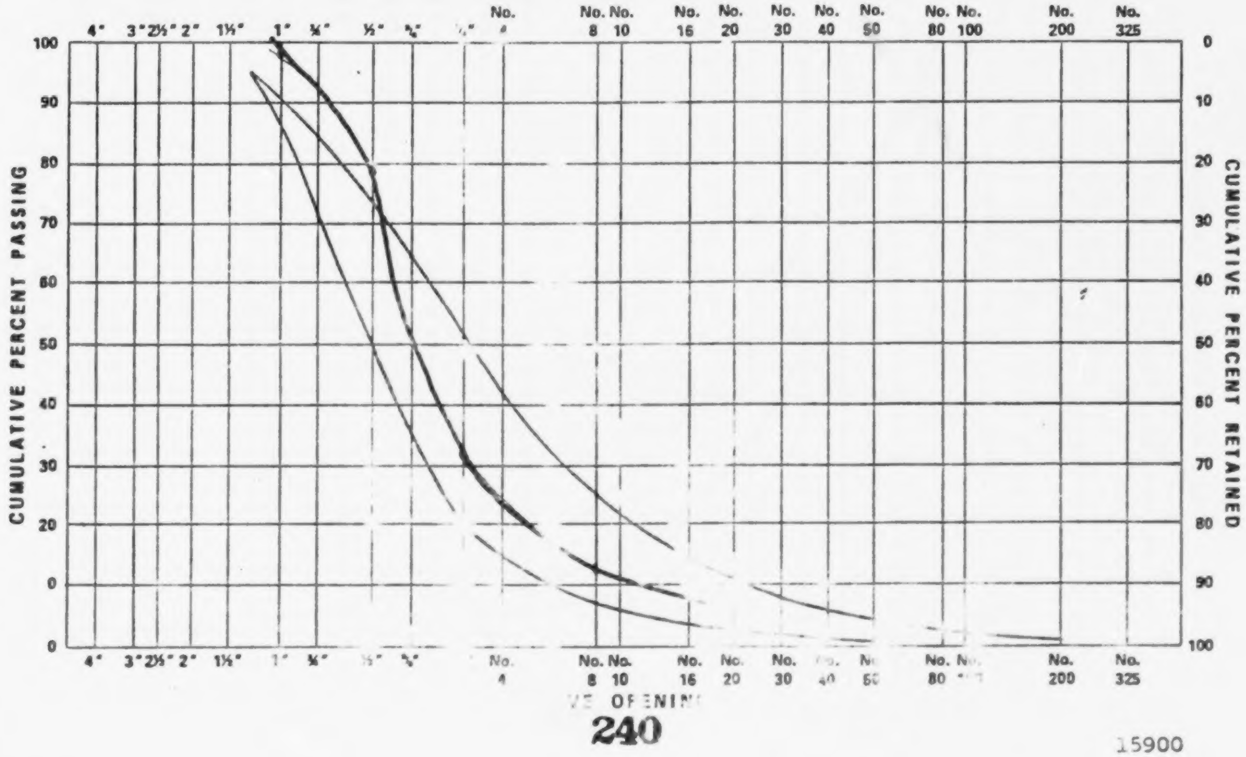


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 23
DATE SAMPLE TAKEN 3-21-78
TEST SITE G
TEST PERFORMED BY JSE
SAMPLE IDENTIFICATION D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	179.2	69.2	1.4	5043.7	100.0	4
1"	↓	1094.0	984.0	19.5	4974.5	98.6	4
1/2"		~~1252.7~~ 1328.3	2360.5	46.8	3990.5	79.1	4
1/4"		1105.0	995.0	19.7	1630.0	32.3	4
#8		344.0	234.0	4.6	635.0	12.6	4
#16		511.0	401.0	8.0	401.0	8.0	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 24

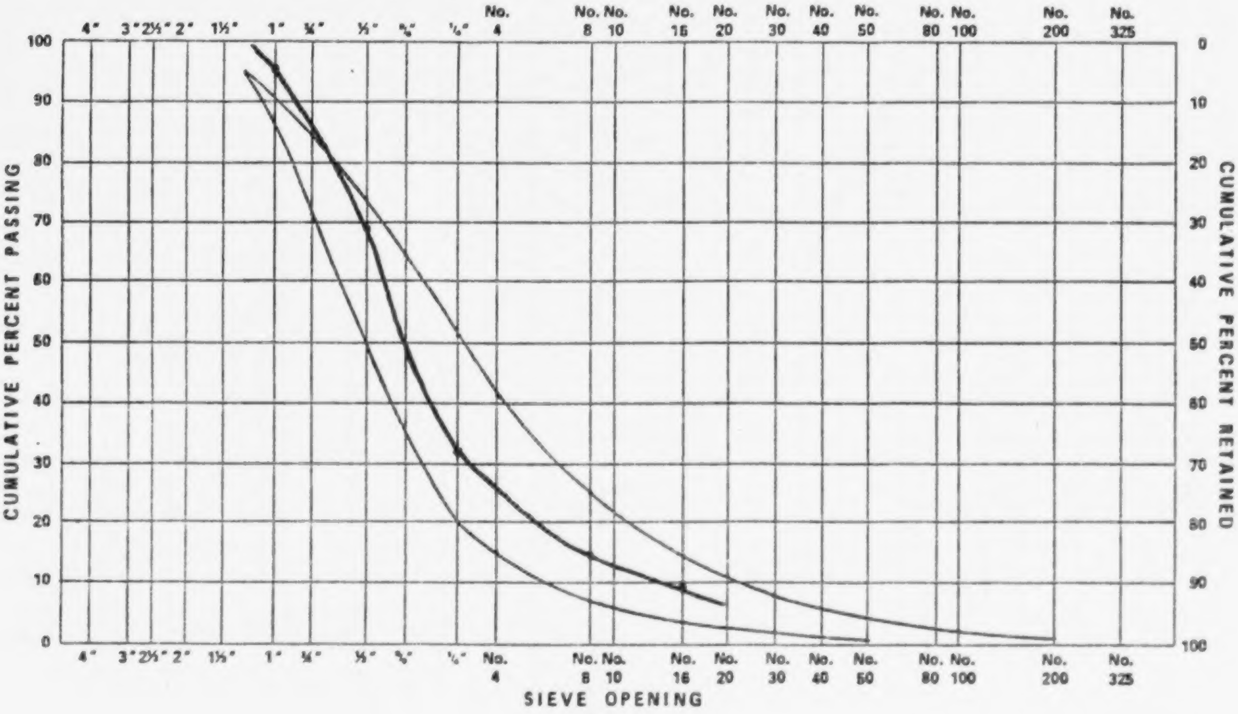
DATE SAMPLE TAKEN 3/24/7[illegible]

TEST SITE G

TEST PERFORMED BY [illegible]

SAMPLE IDENTIFICATION O

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110	341.5	231.5	4.4	5312.4	100.0	4
1"		1516.9	1406.9	26.5	5080.9	95.6	4
½"		1339.4 876.9	1996.3	37.6	3674.0	69.1	4
¼"		1030.8	920.8	17.3	1677.7	31.5	4
#8		350.3	240.3	4.5	756.9	14.2	4
#16		626.6	516.6	9.7	516.6	9.7	4



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

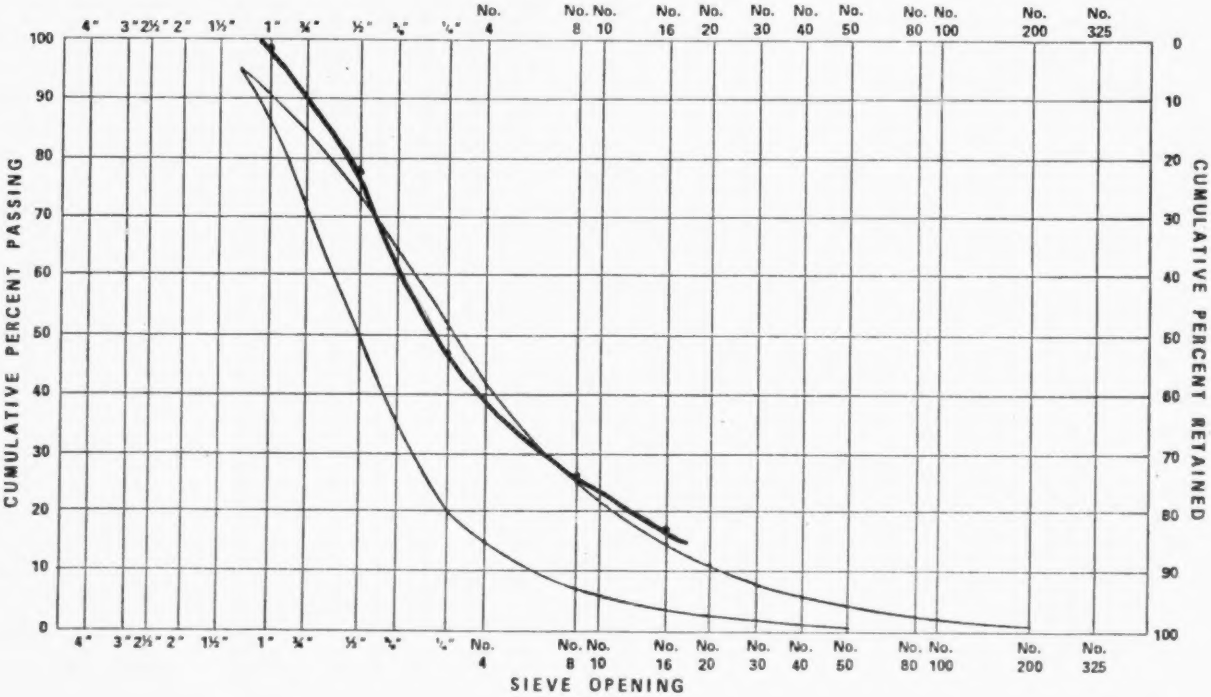
TEST SITE 6

SAMPLE IDENTIFICATION A

DATE SAMPLE TAKEN —

TEST PERFORMED BY JB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	207.6	97.6	1.9	5192.1	100.0	4
1"	↓	1182.7	1072.7	20.7	5094.5	98.2	4
1/2"		885.0 945.0	1605.0	30.9	4021.8	77.5	4
1/4"		1214.8	1104.8	21.3	2416.8	46.6	4
#8		534.1	444.1	8.6	1312.0	25.3	4
#16		977.9	867.9	16.7	867.9	16.7	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

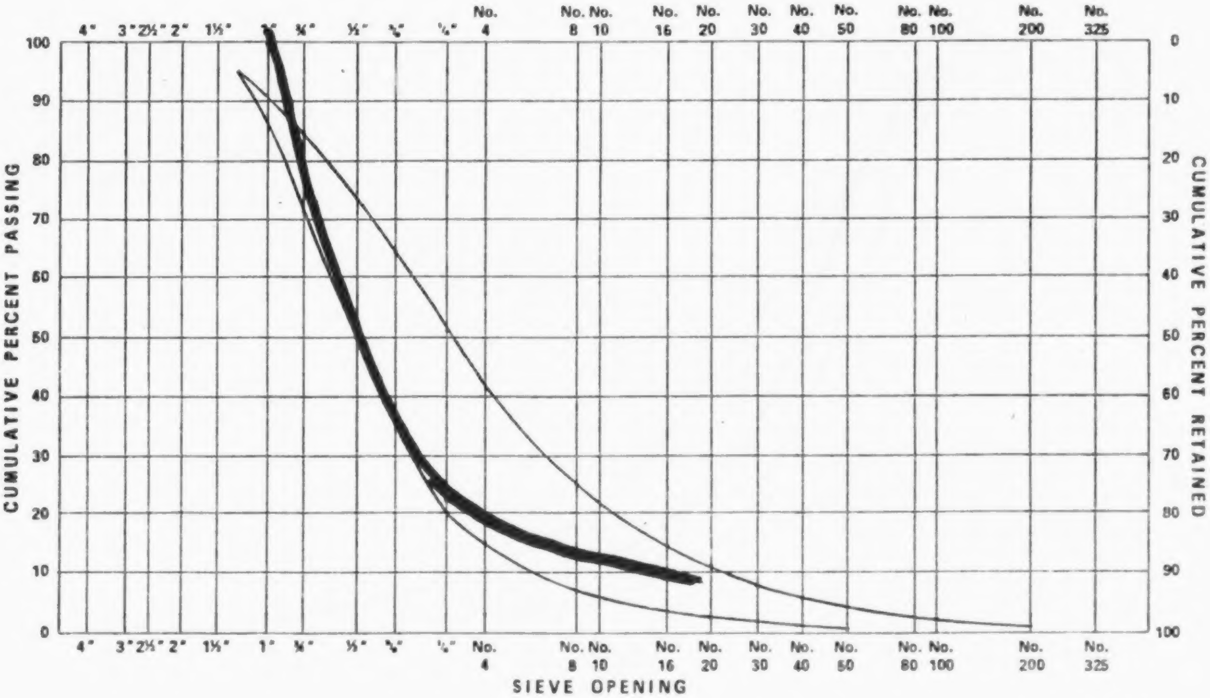
TEST SITE 6

SAMPLE IDENTIFICATION B

DATE SAMPLE TAKEN —

TEST PERFORMED BY JoB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	[illegible]	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.6	127.6	17.0	0.2	8514.3	100.0	4
1"	↓	4316.7	4206.1	49.4	8497.3	99.8	4
½"		2503.1	2392.5	28.1	4291.2	50.4	4
¼"		885.4	774.8	9.1	1898.7	22.3	4
#8		426.6	315.0	3.7	1123.9	13.2	4
#16		698.3	808.9	9.5	808.9	9.5	4

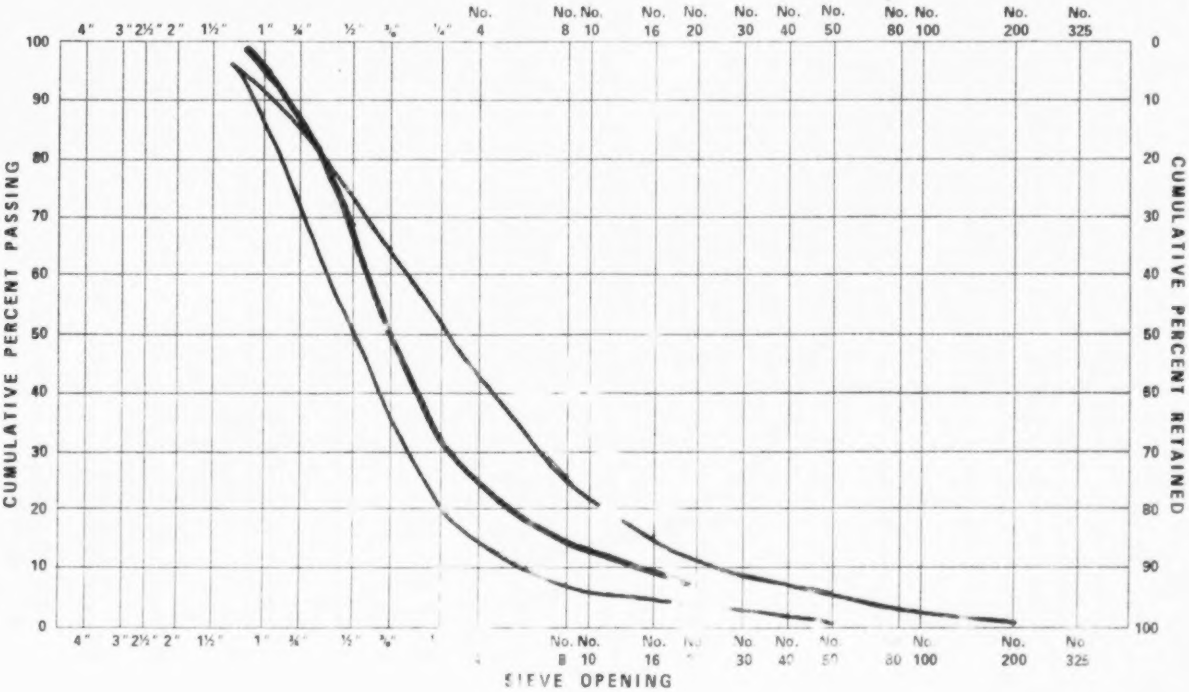


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Comp Coal D
DATE SAMPLE TAKEN —
TEST SITE G
TEST PERFORMED BY JD
SAMPLE IDENTIFICATION Coal D

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.0	417.1	307.1	5.4	5711.5	100.0	4
1"	↓	16099	1499.9	26.3	54045	94.6	4
½"		1354.6 930.6	2065.2	36.2	3904.5	68.3	4
¼"		1125.9	1015.9	17.8	1839.3	32.1	4
#8		409.2	299.2	5.2	823.4	14.3	4
#16		634.2	524.2	9.2	524.2	9.1	4



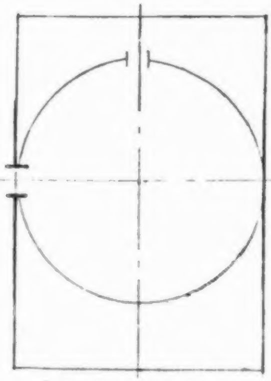
SECTION 6.0

OVERFIRE AIR TRAVERSES

PAGE

6.1 Overfire Air Data Sheets 246

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE

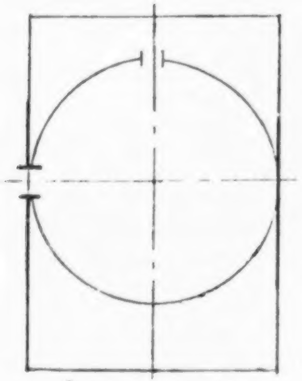


Area = 0.769 ft²
Twet = 57°F
RH = 21%
OFA setting = 66

TEST NO. 13
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - Main Duct - gray Tape standard pitot tube
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 13¼" BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 1⅜" STACK PRESS., Ps, iwg 22
STACK I.D. (DISTANCE A - DISTANCE B) 11⅞" STK. GAS SP. GRAVITY, G_S
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_S), in. H_S0 ΔP₁	ΔP₂	STACK TEMPERATURE (T_S), °F	Twet	OXYGEN %	STACK GAS SPEED, Vs ft/min
1.	3.3	0.392 + 1.375 = 1.767	0.18	0.82	81	57		
2.	10.5	1.247 + " = 2.622	1.40	0.87				
3.	19.4	2.304 + " = 3.679	1.40	0.94				
4.	32.3	3.836 + " = 5.211	1.30	1.10				
5.	67.7	8.039 + " = 9.414	1.30	1.30				
6.	80.6	9.571 + " = 10.946	1.00	1.20				
7.	89.5	10.625 + " = 12.003	1.10	1.10				
8.	96.7	11.483 + " = 12.858	0.80	1.05	↓	↓		
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			1.059	1.021				
TOTAL AVE			1.04					

$$\text{STACK GAS SPEED}, V_s = 174\, F_s \sqrt{\overset{\text{Average}}{\Delta P}(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$



Area = 0.249 ft²
RH = 21%
OFA setting = 66

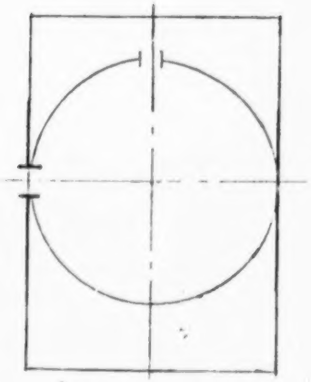
OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE

TEST NO. 13
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - Rear Upper Duct Black [illegible]
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 7⅞" BAROMETRIC PRESS., in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 1⅛" STACK PRESS., Ps, iwg 22
STACK I.D. (DISTANCE A - DISTANCE B) 6¾" STK. GAS SP. GRAVITY, G_S
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	4.4	0.297 + 1.125 = 1.422	2.3	2.2	83	59		
2.	14.7	0.992 + " = 2.117	2.2	2.1	↓	↓		
3.	29.5	1.991 + " = 3.116	2.2	2.0	↓	↓		
4.	70.5	4.759 + " = 5.884	1.5	1.3	↓	↓		
5.	85.3	5.758 + " = 6.883	1.4	1.3	↓	↓		
6.	95.6	6.453 + " = 7.578	1.5	1.3	↓	↓		
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			1.35	1.29				
TOTAL AVE			1.32					

STACK GAS SPEED, $$V_s = 174\, F_s \sqrt{\overset{\text{Average}}{\Delta P}\,(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE



Area = 0.249 ft²
RH = 21%
OFA setting = 68

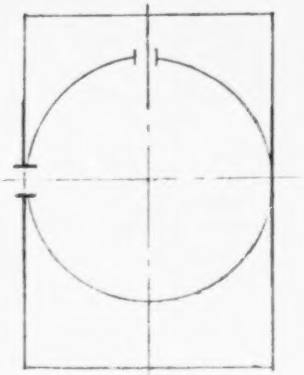
TEST NO. 13
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - REAR Lower OFA ΔP₁ - masking tape ΔP₂ - black
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 8¼" BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 1½" STACK PRESS., Ps, iwg 20
STACK I.D. (DISTANCE A - DISTANCE B) 6¾" STK. GAS SP. GRAVITY, G_S
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP₁	ΔP₂				
1.	4.4	.297 + 1.5 = 1.797	.71	1.10	82	58		
2.	14.7	.992 + = 2.492	.74	1.10	↓	↓		
3.	29.5	1.991 + = 3.491	.83	1.10				
4.	70.5	4.759 + = 6.259	1.10	1.00				
5.	85.3	5.758 + = 7.258	1.10	0.96				
6.	95.6	6.453 + = 7.953	1.10	0.83				
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			0.[illegible]	1.01				
TOTAL AVE			0.98					

STACK GAS SPEED, $$V_s = 174\, F_s \sqrt{\overset{\text{Average}}{\Delta P}(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSE

SMOKESTACK FLOW PROFILE



Area = 0.188 ft²
RH = 21
OFA setting = 68

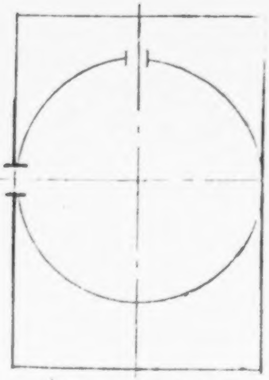
TEST NO. 13
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - FRONT DUCT - white Taps
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 11 1/4" BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 1 3/8" STACK PRESS., Ps , iwg 20
STACK I.D. (DISTANCE A - DISTANCE B) 5 7/8 STK. GAS SP. GRAVITY, G_S
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Tuct		
1.	4.4	.259 + 1.375 = 1.634	0.41	0.40	81	57		
2.	14.7	.864 + = 2.239	0.56	0.42	↓	↓		
3.	29.5	1.733 + = 3.109	0.65	0.43	↓	↓		
4.	70.5	4.142 + = 5.517	0.70	0.50	↓	↓		
5.	85.3	5.011 + = 6.386	0.61	0.72	↓	↓		
6.	95.6	5.617 + = 6.992	0.50	0.60	↓	↓		
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			0.753	0.711				
TRIAL AVE			0.73					

$$\text{STACK GAS SPEED},\ V_s = 174\ F_s \sqrt{\overline{\Delta P}\,(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSE

SMOKESTACK FLOW PROFILE



Area = 0.769 ft²
RH = 21%
OFA setting = 90

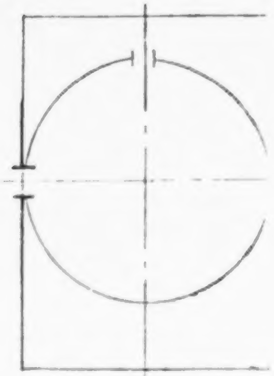
TEST NO. 14
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA- Man Duct - gray tape
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., Ps, iwg 2.3"
STACK I.D. (DISTANCE A - DISTANCE B) 11⅞ STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_S), in. H_S0		STACK TEMPERATURE (T_S), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP.	ΔP2		Twet		
1.	3.3	1.767	0.84	0.75	81	57		
2.	10.5	2.622	1.50	0.83				
3.	19.4	3.679	1.50	0.95				
4.	32.3	5.211	1.30	1.05				
5.	67.7	9.414	1.05	1.20				
6.	80.6	10.946	0.87	1.20				
7.	89.5	12.003	0.82	1.20				
8.	96.7	12.858	0.74	1.20				
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			1.029	1.020				
TOTAL AVE			1.02					

STACK GAS SPEED, $V_S = 174\, F_S \sqrt{\overset{\text{Average}}{\Delta P}\,(T_S + 460)\left(\frac{407}{P_S}\right)\left(\frac{1.00}{G_S}\right)}$

OVERFIRE AIR TRAVERSE

SMOKESTACK FLOW PROFILE



Area = 0.249 ft²
RH = 21%
OFA setting = 90

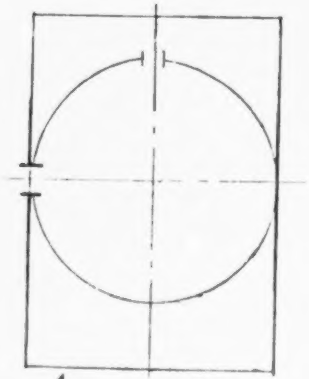
TEST NO. 14
LOCATION NO. TEST SITE 9
DATE March 15 1979
SAMPLING LOCATION OFA- Rear Upper DUCT - black [illegible]
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS., in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS. Ps, iwg 2.3"
STACK I.D. (DISTANCE A - DISTANCE B) 6¾" STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_S), in. H_S0		STACK TEMPERATURE (T_S), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	4.4	1.422	2.2	2.2	84	59		
2.	14.7	2.117	2.2	2.1				
3.	29.5	3.116	2.1	2.1				
4.	70.5	5.884	1.4	1.2				
5.	85.3	6.883	1.7	1.0				
6.	95.6	7.578	1.2	1.0	↓	↓		
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average ΔP			1.333	1.246				
TOTAL AVE			1.29					

$$\text{STACK GAS SPEED, } V_s = 174\,F_s\sqrt{\overset{\text{Average}}{\Delta P}(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE

TEST NO. 14
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - Rear lower Duct ΔP1 - masking tape ΔP2 - black
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., Ps, iwg 21"
STACK I.D. (DISTANCE A - DISTANCE B) 6 3/4 STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE



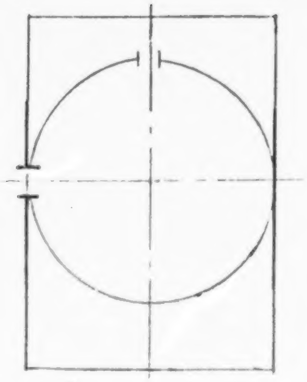
Area = 0.249 ft²
RH = 21%
OFA setting = 90

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP1	ΔP2		Twet		
1.	4.4	1.797	0.93	0.63	83°F	59		
2.	14.7	2.492	1.0	0.77				
3.	24.5	3.491	1.1	0.88				
4.	70.5	6.259	1.2	1.1				
5.	85.3	7.258	1.1	1.2				
6.	95.6	7.953	0.90	1.3	↓	↓		
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			1.018	0.982				
TOTAL AVE			1.00					

$$\text{STACK GAS SPEED, } V_s = 174\, F_s \sqrt{\overline{\Delta P}\,(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

(Average over ΔP)

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE



Area = 0.188 ft²
RH = 21
OFA setting = 90

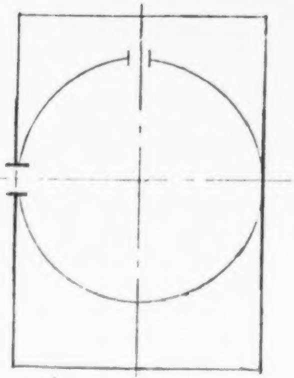
TEST NO. 14
LOCATION NO. TEST SITE G
DATE March 15, 1979
SAMPLING LOCATION OFA - Front D.T. - white tape
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) BAROMETRIC PRESS, in.Hg 30.58
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) STACK PRESS., Ps, iwg 21"
STACK I.D. (DISTANCE A - DISTANCE B) 5⅞ STK. GAS SP. GRAVITY, G_S
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_s0		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	4.4	1.634	0.65	0.62	82	58		
2.	14.7	2.239	0.70	0.65				
3.	29.5	3.109	0.68	0.78				
4.	70.5	5.517	0.70	0.69				
5.	85.3	6.386	0.60	0.45				
6.	95.6	6.492	0.57	0.44				
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			0.806	0.774				
			0.79					

$$\text{STACK GAS SPEED},\ V_s = 174\ F_s \sqrt{\overset{\text{Average}}{\Delta P (T_s + 460)}\ \left(\frac{407}{P_s}\right)\ \left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE

TEST NO. 21
LOCATION NO. TEST SITE G
DATE March 22, 1979
SAMPLING LOCATION OFA - Main Duct - gray tape using standard pitot
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS, in.Hg 30.51
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., Ps, iwg 16
STACK I.D. (DISTANCE A - DISTANCE B) 10⅜ STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE



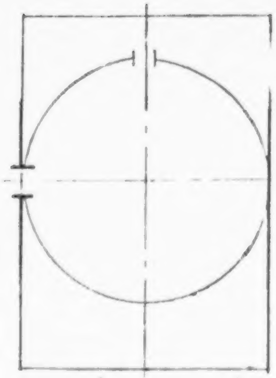
Area = 0.769 ft²
OFA setting = 40
RH = 50%

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	3.3	1.767"	0.48	0.56	80	67		
2.	10.5	2.622	0.71	0.65				
3.	19.4	3.679	0.81	0.74				
4.	323	5.211	0.94	0.79				
5.	67.7	9.414	1.10	1.20				
6.	80.6	10.946	0.93	1.20				
7.	89.5	12.003	0.77	1.20				
8.	96.7	12.858	0.67	1.10	↓	↓		
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average ΔP'			0.889	0955				
TOTAL AVE			0.92					

$$\text{STACK GAS SPEED, } V_s = 174\, F_s \sqrt{\overset{\text{Average}}{\Delta P}(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$

OVERFIRE AIR TRAVERSES
SMOKESTACK FLOW PROFILE

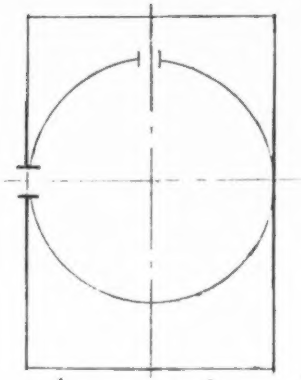
TEST NO. 21
LOCATION NO. TEST SITE G
DATE March 22, 1979
SAMPLING LOCATION OFA - Rear Upper Duct - black tr
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS., in.Hg 30.51
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., , iwg 15
STACK I.D. (DISTANCE A - DISTANCE B) ______ STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE



Area = 0.249 ft^2
RH = 50%
OFA setting = 40

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	4.4	1.422"	1.20	1.20	79	66		
2.	14.7	2.117	1.3	1.05	↓	↓		
3.	29.5	3.116	1.4	1.0				
4.	70.5	5.884	0.56	0.95				
5.	85.3	6.883	0.33	0.87				
6.	95.6	7.518	0.22	0.85				
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			0.868	0.992				
TOTAL AVE			0.93					

$$\text{STACK GAS SPEED, } V_s = 174\,F_s \sqrt{\overline{\Delta P}\,(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$



Area = 0.246 ft²
RH = 50%
OFA setting = 42

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE

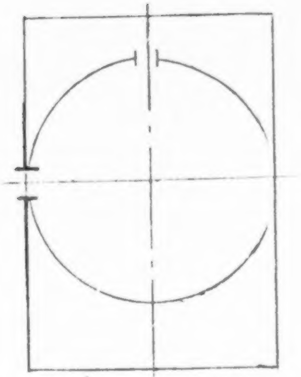
TEST NO. 21
LOCATION NO. TEST SITE G
DATE March 22, 1979
SAMPLING LOCATION OFA - Rear Lower ΔP1 - Masking Tape ΔP2 - black
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS, in.Hg ______
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., Ps, iwg ______
STACK I.D. (DISTANCE A - DISTANCE B) 6¾" STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_S), in. H_S0		STACK TEMPERATURE (T_S), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP1	ΔP2		Twet		
1.	4.4	.797"	0.55	1.10	78	67		
2.	14.7	2.492"	0.75	1.10				
3.	29.5	3.491	0.83	1.20				
4.	70.5	6.259	0.99	1.30				
5.	85.3	7.258	0.82	1.40				
6.	95.6	7.953	0.77	1.50				
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average								

STACK GAS SPEED,

$$V_S = 174\ F_S \sqrt{\overset{\text{Average}}{\Delta P(T_S + 460)}\ \left(\frac{407}{P_S}\right)\ \left(\frac{1.00}{G_S}\right)}$$

OVERFIRE AIR TRAVERSE
SMOKESTACK FLOW PROFILE



Area = 0.188 ft²
RH = 21
OFA setting 4/2

TEST NO. 21
LOCATION NO. TEST SITE G
DATE March 22, 1979
SAMPLING LOCATION OFA - Front Duct - white tape
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE A) ______ BAROMETRIC PRESS, in.Hg 30.51
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE B) ______ STACK PRESS., Ps, iwg 13"
STACK I.D. (DISTANCE A - DISTANCE B) 11/4 STK. GAS SP. GRAVITY, G_S ______
NEAREST UPSTREAM DISTURBANCE ______
NEAREST DOWNSTREAM DISTURBANCE ______

TRAVERSE POINT NUMBER	% OF STACK DIAMETER	DISTANCE FROM INSIDE WALL	VELOCITY HEAD (Δp_s), in. H_sO		STACK TEMPERATURE (T_s), °F		OXYGEN %	STACK GAS SPEED, Vs ft/min
			ΔP_1	ΔP_2		Twet		
1.	4.4	1.634"	0.33	0.44	80	67		
2.	14.7	2.239	0.50	0.45	↓	↓		
3.	29.5	3.109	0.54	0.55				
4.	70.5	5.517	0.50	0.51				
5.	85.3	6.386	0.48	0.47				
6.	95.6	6.992	0.40	0.41				
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
Average $\sqrt{\Delta P}$			0.675	0.686				
TOTAL AVE			0.68					

$$\text{STACK GAS SPEED}, V_s = 174\, F_s \sqrt{\overset{\text{Average}}{\Delta P}(T_s + 460)\left(\frac{407}{P_s}\right)\left(\frac{1.00}{G_s}\right)}$$